6 Inch Speed Dome

Installation Manual

V2.0.0

2010-01

Thank you for purchasing our product. If there is any question or request, please do not hesitate to contact dealer.

This manual is applicable to 6 Inch Speed Dome.

This manual may contain several technically incorrect places or printing errors, and the content is subject to change without notice. The updates will be added into the new version of this manual. We will readily improve or update the products or procedures described in the manual.

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss. The precaution measure is divided into “Warnings” and “Cautions”:

Warnings: Neglecting any of the warnings may cause serious injury or death.

Cautions: Neglecting any of the cautions may cause injury or equipment damage.

Warnings Follow these safeguards to prevent serious injury or death.	**Cautions** Follow these precautions to prevent potential injury or material damage.

Warnings

1. In the use of the product, you must be strict compliance with the electrical safety regulations of the nation and region.
2. Please use the power adapter, which is provided by normal company. The standard of the power adapter is AC24V/3A.
3. Do not connect several devices to one power adapter as adapter overload may cause over-heat or fire hazard.
4. Please make sure that the plug is firmly connected on the power socket.
5. When the product is installed on wall or ceiling, the device shall be firmly fixed.
6. If smoke, odors or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.
7. If the product does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the camera yourself. (We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.)

Warnings

1. Do not drop the dome or subject it to physical shock, and do not expose it to high electromagnetism radiation. Avoid the equipment installation on vibrations surface or places subject to shock (ignorance can cause equipment damage).
2. Do not place the dome in extremely hot, cold (the operating temperature shall be -30°C ~ +65°C), dusty or damp locations, or fire or electrical shock will occur otherwise.
3. The dome cover for indoor use shall be kept from rain and moisture.
4. Exposing the equipment to direct sun light, low ventilation or heat source such as heater or radiator is forbidden (ignorance can cause fire danger).
5. Do not aim the camera at the sun or extra bright places. A blooming or smear may occur otherwise (which is not a malfunction however), and affecting the endurance of CCD at the same time.
6. Please use the provided glove when open up the dome cover, avoid direct contact with the dome cover, because the acidic sweat of the fingers may erode the surface coating of the dome cover.
7. Please use a soft and dry cloth when clean inside and outside surfaces of the dome cover, not to use alkaline detergents.

Preparation for Installation

1. Basic requirements
   1) All the electronic operation should be strict compliance with the local electrical safety regulations, fire prevention regulations and other related regulations at the installation place.
   2) Check whether all the accessories are there according to the packing list, make sure that the place and installation mode are conform to the demands, if not, please contact the supplier.
   3) Please use this product according to the working environment.
2. Check installation space.

   Make sure the place have enough space to install the speed domes and its accessories.
3. Check the intensity of conformation at the installation scene.

   Please make sure that the endure ability of ceilings or walls is 4 times as the weight of speed dome and its accessories.
4. Preparation of cables
   - Choose the video cable according to the transmission length. The video should meet the least demands as:
     1. 75Ω resistance
     2. 100% copper core conducting wire.
     3. 95% weaving copper shield.
   - RS485 communication cable, please refer to Appendix 2
   - 24V AC power cable, please refer to Appendix 3

5. Please keep all wrappers

   Please keep all wrappers after unpack them for future use. In case of any failure occurred, please return the speed dome to the factory with the original wrapper.

   Note: Transportation without the original wrapper may result in damage on the speed dome and cost additional charge.

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Chapter 1 Installation

1.1 Check Parts List

Prior to installation, unpack the dome unit and check whether it is in good condition and all parts and accessories are included by referring to the packing list).

Note: The power supply for the speed dome is 24VAC/3A.

1.2 Installation

1.2.1 High Speed Dome Installation

Note: The following installation instructions are applicable to both high speed dome and network speed dome models.

1. Install the dome mount. Please refer to the related sections from *Chapter2* to *Chapter7* for specific installation methods of different mounts.

2. Open the bubble and remove the expand aple poly ethylene and protective sticker from the dome drive. Refer to Figure 1.2.1.

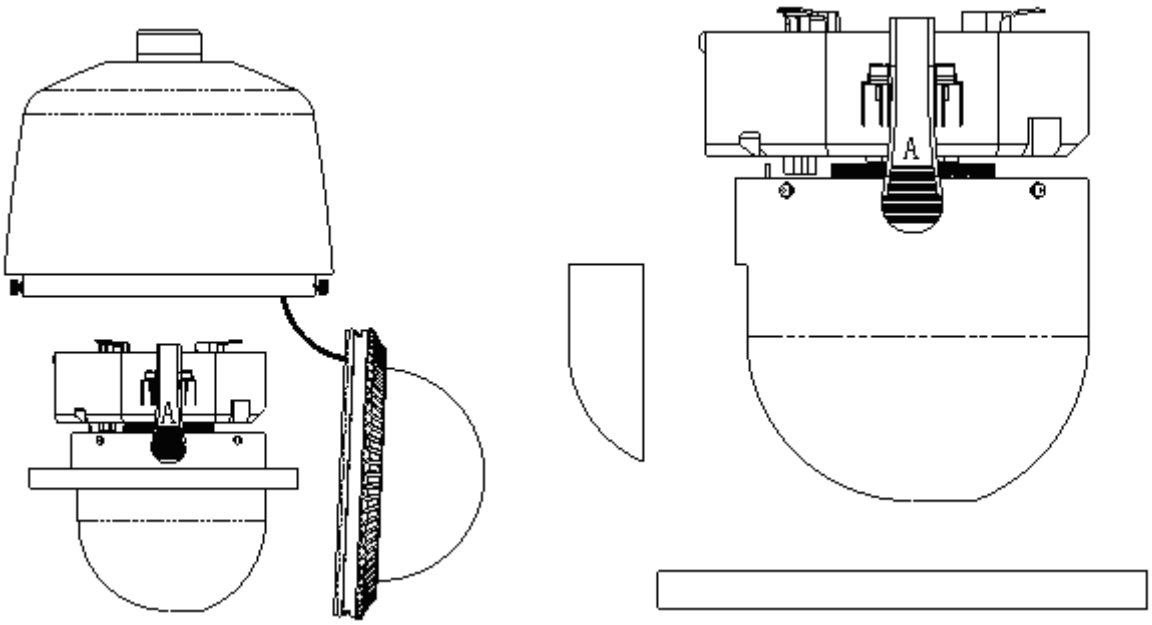
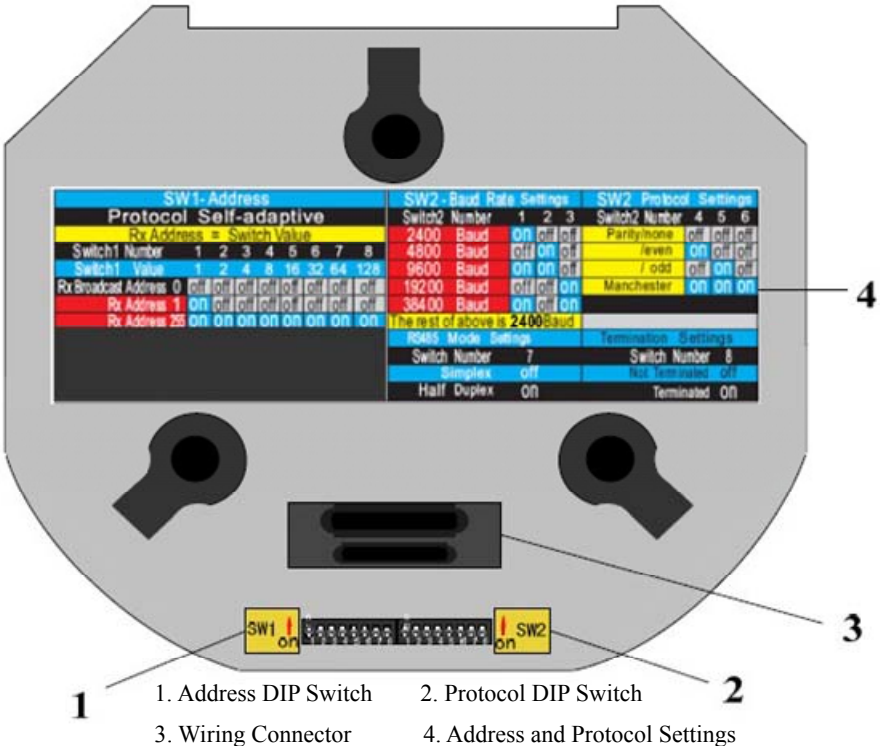


Figure 1.2.1 Open bubble and remove the expand aple
poly ethylene and protective sticker from dome drive

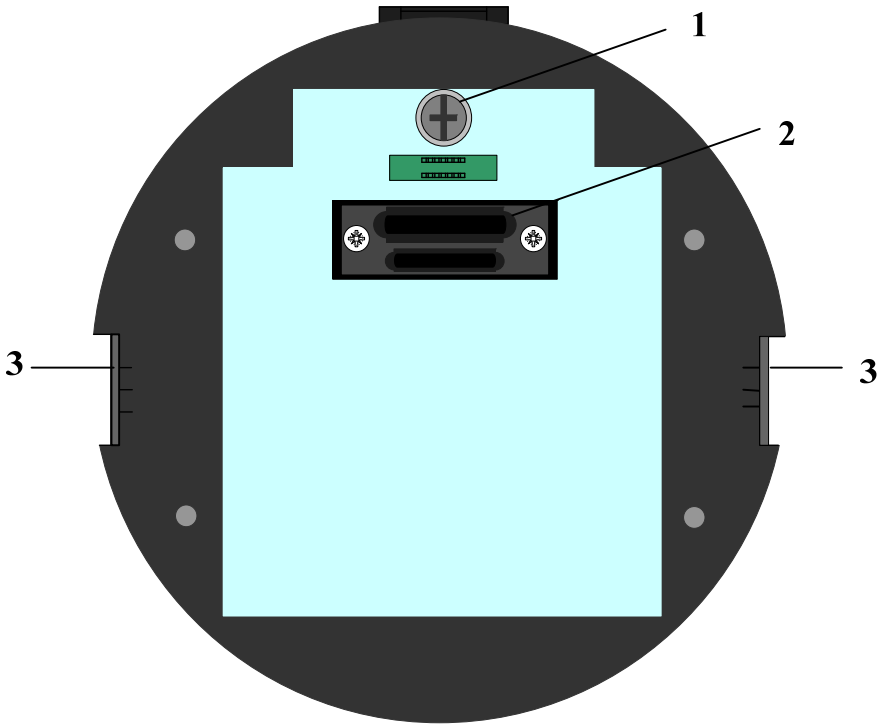
3. Configure the dome address, baud rate and other settings through DIP switch SW1 and SW2 located on the bottom board of the dome drive, as shown in Figure 1.2.2. Please refer to *Section 1.4 DIP Switch Settings* for setting address, baud rate, communication protocol, etc.



1. Address DIP Switch 2. Protocol DIP Switch
3. Wiring Connector 4. Address and Protocol Settings

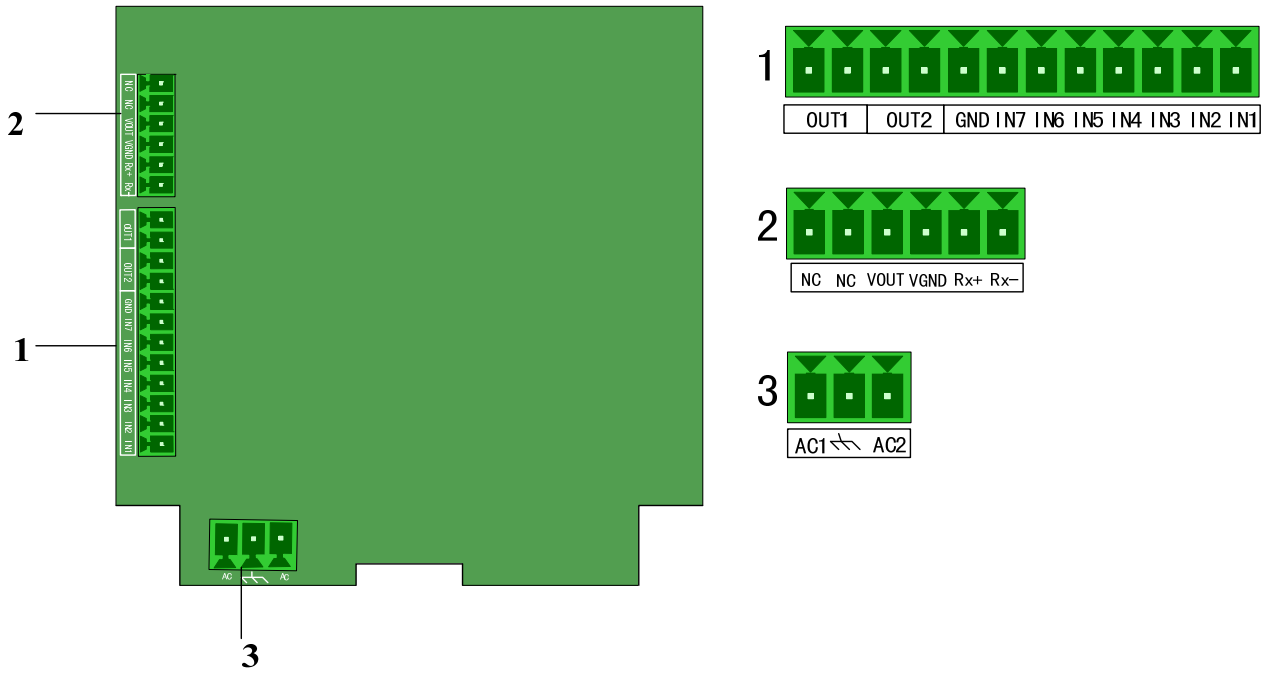
Figure 1.2.2 Bottom Board of Dome Drive

4. Loosen the captive screw on the interconnect board of back box and lift the hinged door to the circuit board, as shown in Figure 1.2.3. Unplug the video cable, power cord and other cables terminals to avoid cables twisting during the back box installation. The circuit board of dome is shown in Figure 1.2.3. And refer to Figure 1.2.4 (high speed dome) and Figure 1.2.5(network high speed dome) for the wiring terminals.



1. Captive Screw
2. Wiring Connector
3. Lock Clips

Figure 1.2.3 Back Box Interconnect Board

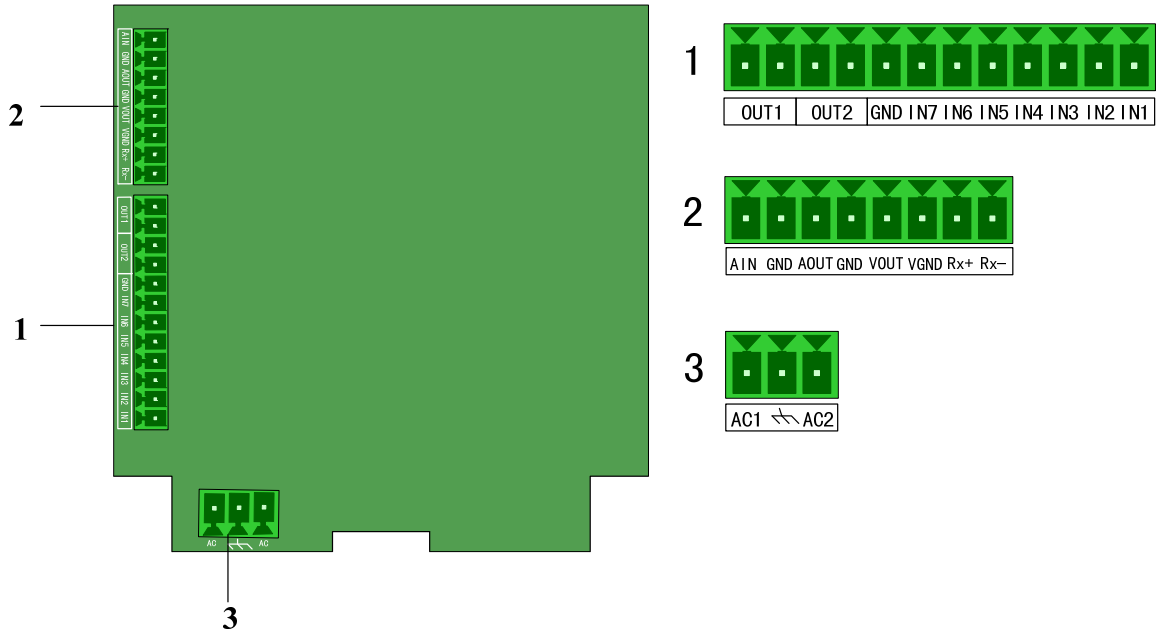


1: Alarm In/Out Terminals (7 inputs/2outputs)

2: Video Out and RS-485 COM Terminals

3: 24VAC Voltage Input and GND Terminals

Figure 1.2.4 Back Box Circuit Board (High Speed Dome)



1: Alarm In/Out Terminals (2 inputs/2 outputs)

2: Audio In/Out, Video Out and RS-485 COM Terminals

3: 24VAC Voltage Input and GND

Figure 1.2.5 Back Box Circuit Board (Network High Speed Dome) \

5. Attach the back box of dome to the mount.

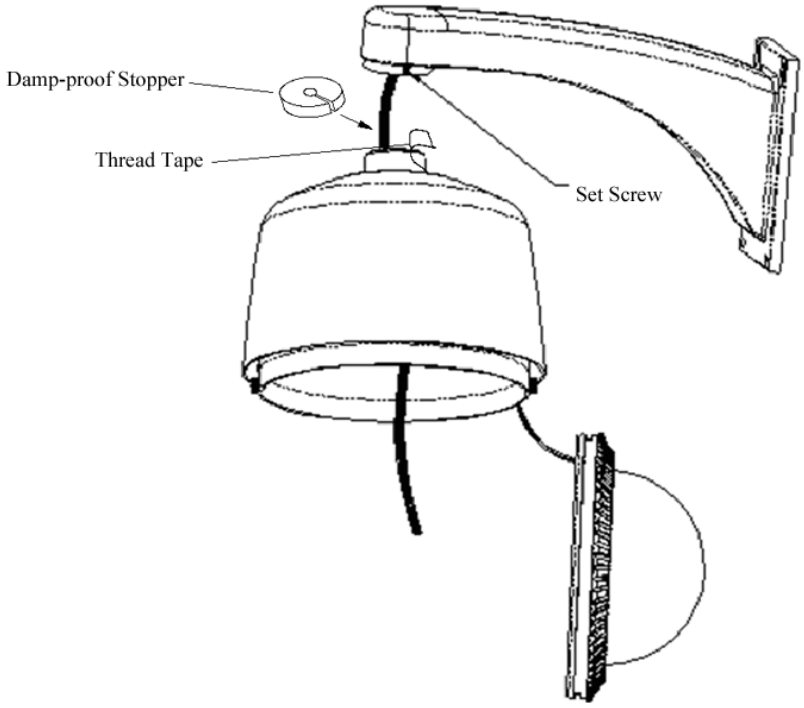


Figure 1.2.6 Attach Back Box to Mount

Note: For outdoor applications, please apply the thread compound and the damp-proof stopper to threads of the back box and the mount.

After having made connections of the power cord, video cable, RS-485 control line and alarm input/output lines (if required), close the hinged door and tighten the captive screw, as shown in Figure 1.2.6.

6. Install the dome drive

As shown in Figure 1.2.7, align the tabs on both sides of the dome drive with the corresponding arrow labels on the back box to snap the drive into the back box firmly.

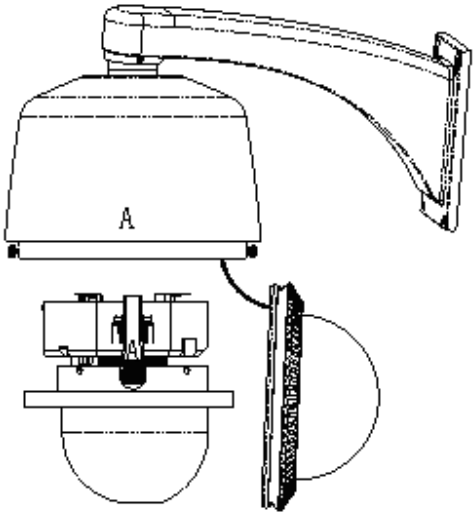


Figure 1.2.7 Install Dome Drive

7. Install the bubble and fasten the two set screws on both sides, as shown in Figure 1.2.8.

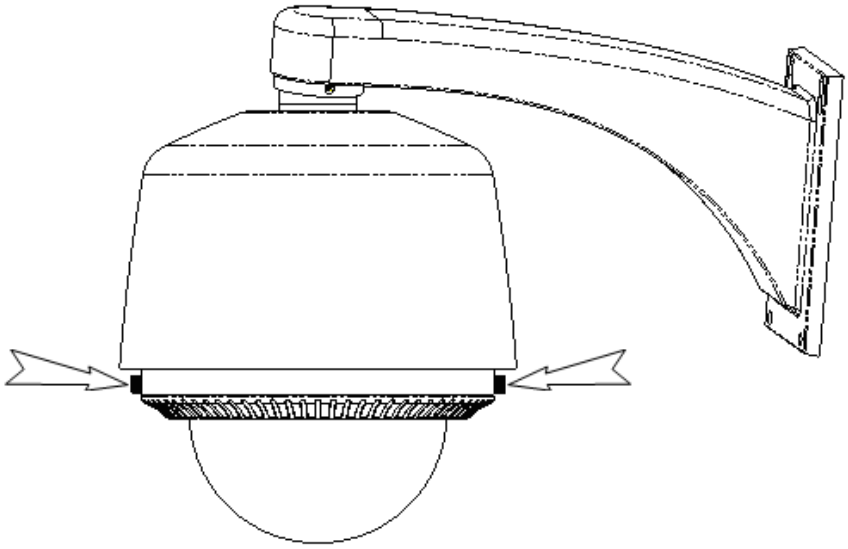


Figure 1.2.8 Install Bubble

1.2.2 Medium Speed Dome and Network High-definition Dome Installation

Note: The following installation instructions are applicable to both medium speed dome and HD network speed dome models.

1. Install the dome mounts. Please refer to the related sections from *Chapter2* to *Chapter7* for specific installation methods of different mounts.

2. Open the bubble, push the two clips on both sides of the dome drive towards the back box, and then take off the dome drive. Remove the expand aple poly ethylene and protective sticker from the dome drive. Refer to Figure 1.2.9.

Push the tab lock on the bottom interconnect board of back box and lift the hinged door to the circuit board, as shown in Figure 1.2.9. Unplug the video cable, power cord and other cables terminals to avoid cables twisting during the back box installation. Refer to Figure 1.2.10 (medium speed dome) and Figure1.2.11 (network speed dome and network high-definition speed dome) for the wiring terminals on back box circuit board.

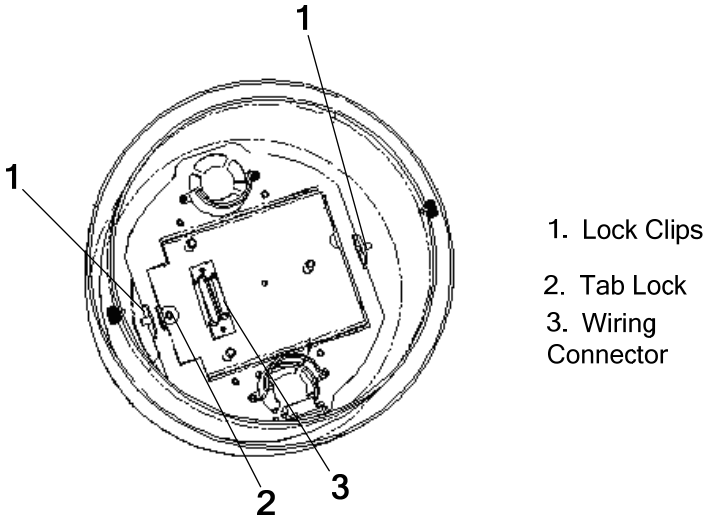
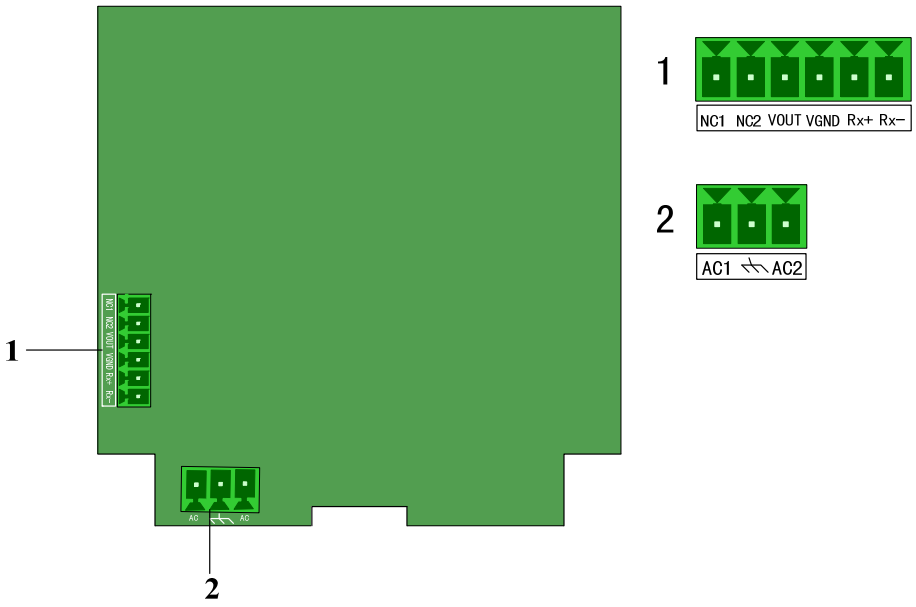


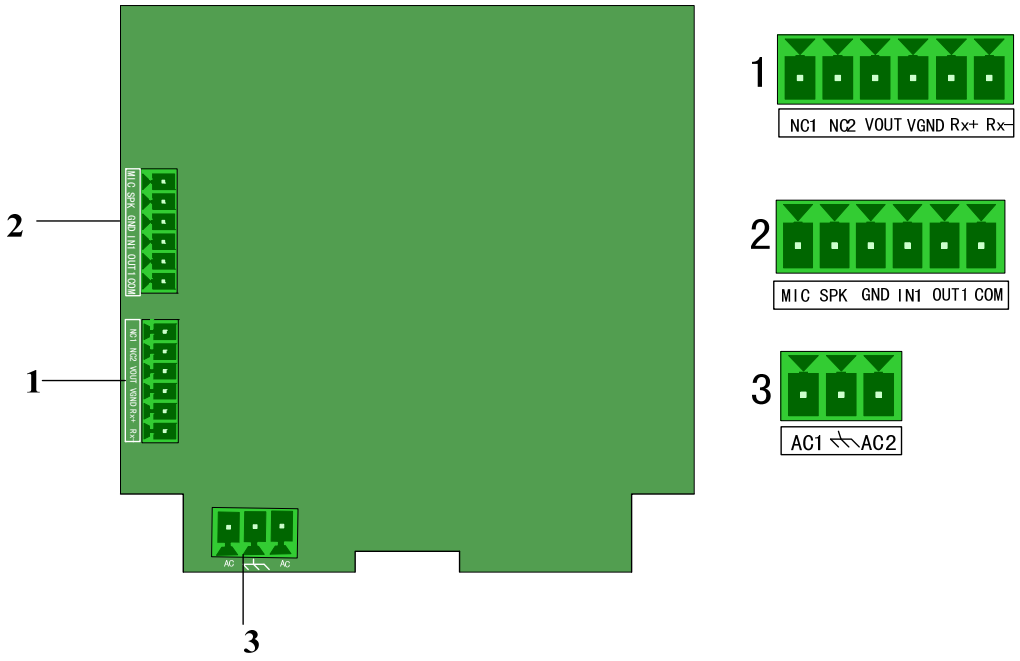
Figure 1.2.9 Back Box Interconnect Board



1: Video Out and RS-485 COM Terminals

2: 24VAC Voltage Input and GND Terminals

Figure 1.2.10 Back Box Circuit Board (Medium Speed Dome)



1: Video Out and RS-485 COM Terminals

2: Audio In/Out, Alarm In/Out Terminals and GND(1 inputs/1outputs)

3: 24VAC Voltage Input and GND Terminals

Figure 1.2.11 Back Box Circuit Board (Network Medium Speed Dome and Network High-definition Speed Dome)

3. Configure the dome address, baud rate and other settings through DIP switch SW1 and SW2 located on the bottom board of the dome, as shown in Figure 1.2.2. Please refer to Section 1.4 DIP Switch Settings for setting address, baud rate, communication

protocol, etc.

SW1 - ADDRESS									
Protocol Self-adaptive									
Rx Address = Switch Value									
Switch1 Number	1	2	3	4	5	6	7	8	
Switch1 Value	1	2	4	8	16	32	64	128	
Rx Broadcast Address 0	off	off	off	off	off	off	off	off	
Rx Address 1	on	off	off	off	off	off	off	off	
Rx Address 255	on	on	on	on	on	on	on	on	

SW2 - Baud Rate Settings				
Switch2 Number		1	2	3
2400	Baud	on	off	off
4800	Baud	off	on	off
9600	Baud	on	on	off
19200	Baud	off	off	on
38400	Baud	on	off	on
The rest of above is 2400 Baud				

SW2 Protocol Settings				
Switch2 Number		4	5	6
Parity/none		off	off	off
/even		on	off	off
/odd		off	on	off
Manchester		on	on	on

RS485 Mode Settings	
Switch Number	7
Simplex	off
Half Duplex	on

Termination Settings	
Switch Number	8
Not Terminated	off
Terminated	on

Figure 1.2.12 Address and Protocol Settings

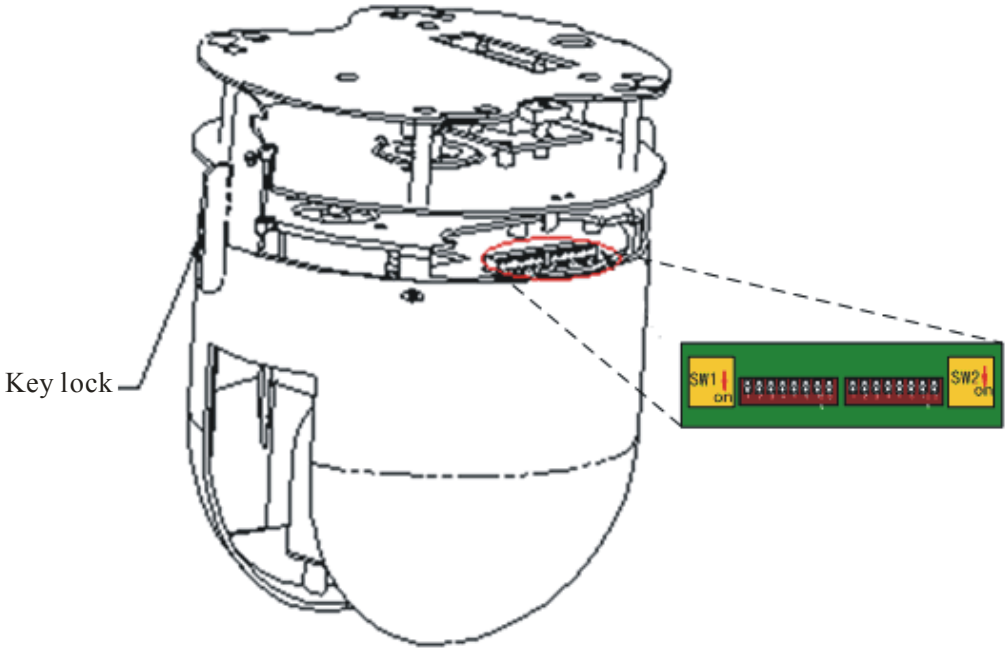


Figure1.2.13 DIP Switch Location on Side of Dome Drive

4. Install the back box. Open the interconnect board of the back box, and feed the cables through the top of the back box from the mount, and connect to the back board circuit board. Attach the back box to the mount and tighten the set screws (see Figure1.2.14) to secure the back box. Connect all wiring and replace the interconnect board.

Note: For outdoor applications, please apply the thread compound and the damp-proof stopper to threads of the back box and the mount.

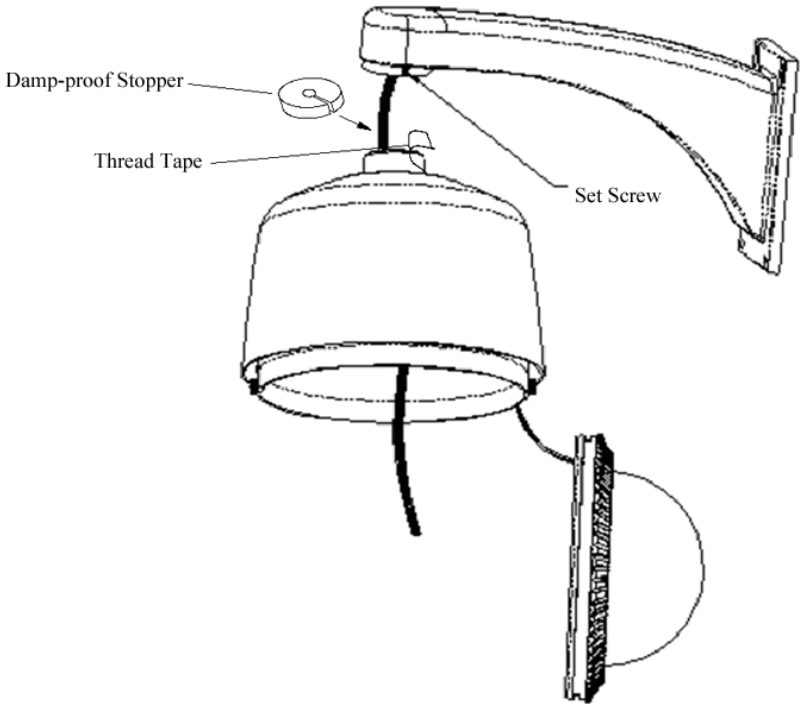


Figure 1.2.14 Attach Back Box to Mount

5. Install the dome drive. Push the two tabs on both sides of the dome drive, and line up the AMP connectors to insert the dome drive into the back box by following the guided pillar. Continue pushing on the both ends of the tabs until both sides click firmly into place.

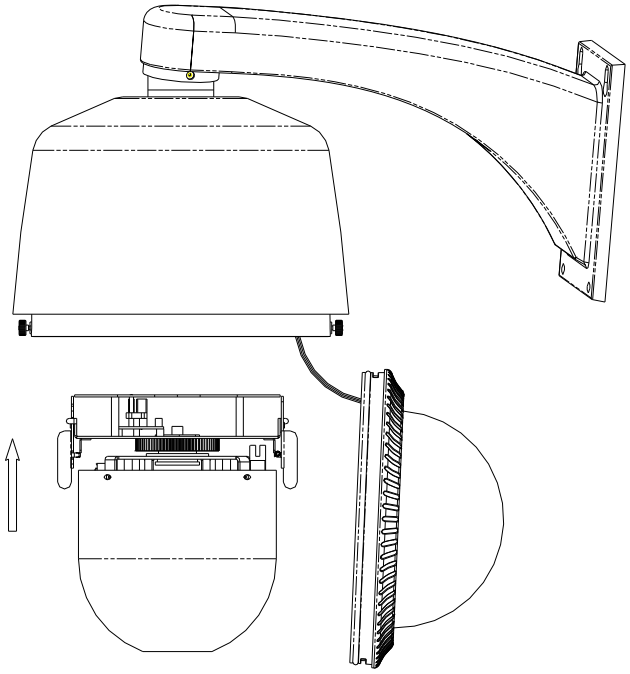


Figure 1.2.15 Install Dome Drive

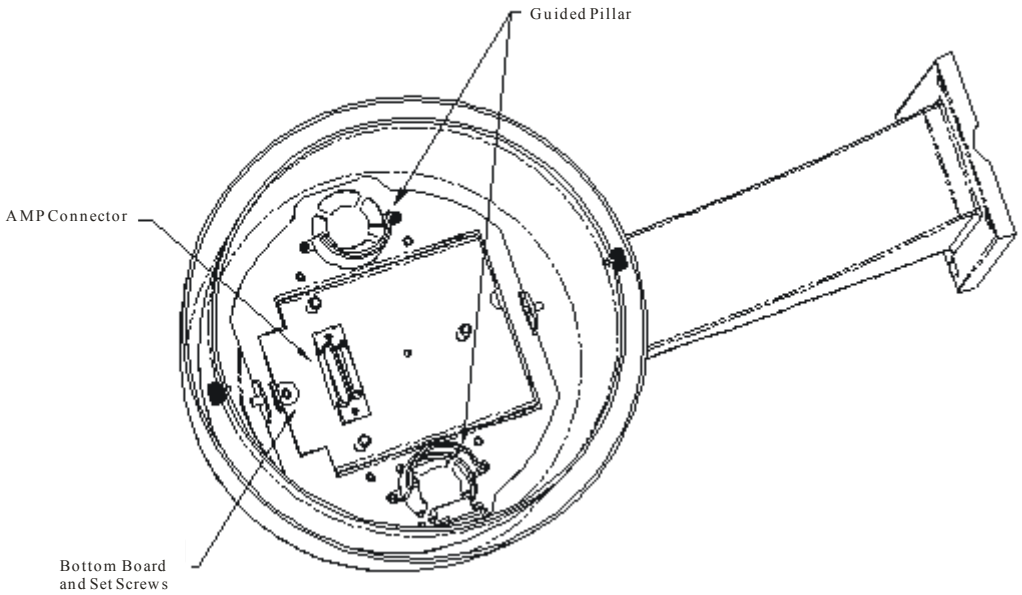


Figure 1.2.16 AMP Connector and Guided Pillar on Interconnect Board

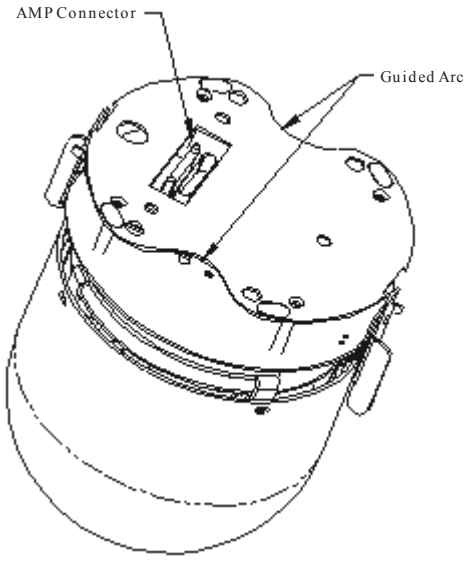


Figure 1.2.17 AMP Connector and Guided Arc on Dome Drive Bottom Board

6. Install the bubble by aligning the two grooves (see Figure 1.2.18) on the trim ring of the bubble with the two set screws (see Figure 1.2.19) on the back box, and then fasten the set screws to secure the bubble.

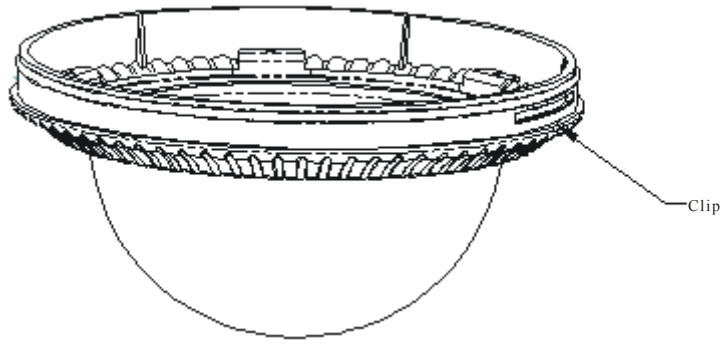


Figure 1.2.18 Install Bubble

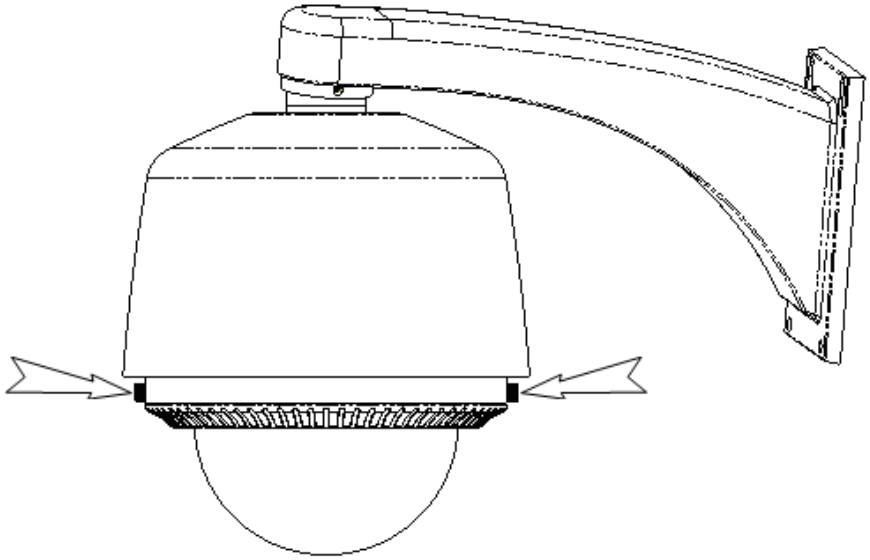


Figure 1.2.19 Tighten the Set Screws

1.3 Initial Settings

Address code: 0

Baud rate: 2400

120Ω terminator: OFF

1.4 DIP Switch Settings

1.4.1 High Speed Dome DIP Switch Settings

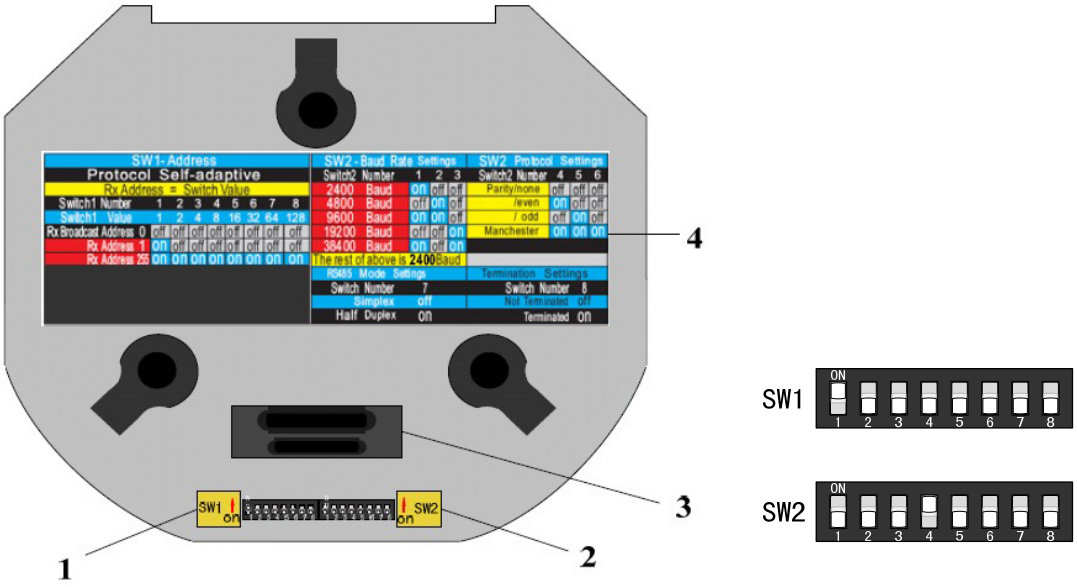


Figure 1.4.2 Bottom Board of Dome Drive

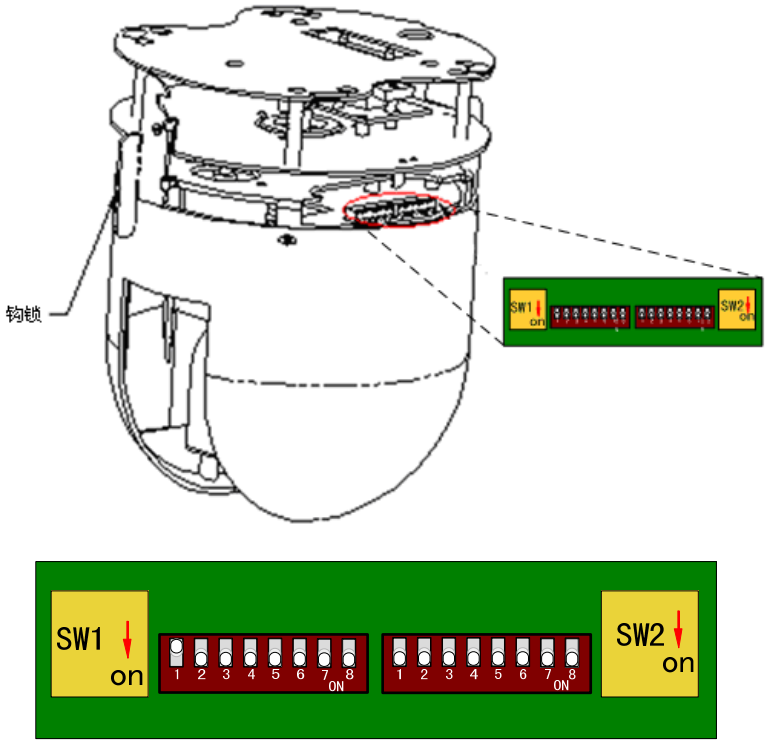
1. Address DIP Switch 2. Protocol DIP Switch

3. Wiring Connector 4. Address and Protocol Settings

The dome provides two DIP switches *SW1* and *SW2* for setting the dome address, baud rate, protocol, etc. As shown in Figure 1.4.2, ON=1, OFF=0. In SW1 and SW2, 1 is the lowest position and 8 is the highest position. Please refer to the following list for specific settings:

Note: As the high speed dome is capable of being self-adaptive to PELCO-D, PELCO-P, HIK-Code, VICON and KALATEL-32 protocols, and the network speed dome is self-adaptive to Pelco-P, Pelco-D and HIK-Code protocols as well, no DIP switch settings for control protocol are required.

1.4.2 Medium Speed Dome and Network High-definition Speed Dome DIP Switch Settings



1: SW1 Address DIP Switch 2: SW2 Protocol DIP Switch

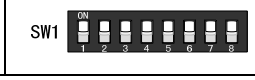
Figure1.4.3 DIP Switch Location on Side of Dome Drive

The dome provides two DIP switches *SW1* and *SW2* for setting the dome address, baud rate, protocol, etc. As shown in Figure 1.4.2, ON=1, OFF=0. In SW1 and SW2, 1 is the lowest position and 8 is the highest position. Please refer to the following list for specific settings:

Note: As the medium speed dome and the network medium speed dome are capable of being self-adaptive to PELCO-D, PELCO-P and HIK-Code protocols, no DIP switch settings for control protocol are required.

1.4.3 Address Settings

The DIP Switch SW1 is used for setting the dome address:

Dome Address	SW1 Settings	1	2	3	4	5	6	7	8
0		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1		ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
255		ON	ON	ON	ON	ON	ON	ON	ON

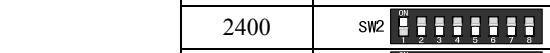
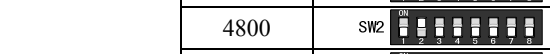
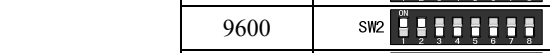
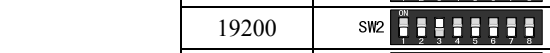
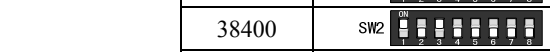
Settings for address 0~71 are listed as below:

SW1 Position	DIP Switch SW1 Settings							
Address	1	2	3	4	5	6	7	8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF

41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
61	ON	OFF	ON	ON	ON	ON	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
71	ON	ON	ON	OFF	OFF	OFF	ON	OFF

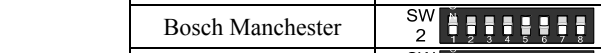
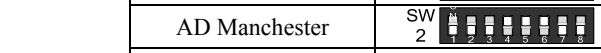
1.4.4 Baud Rate Settings

The positions 1-3 of DIP Switch SW2 are used for setting the baud rate of dome, respectively as 2400bps, 4800bps, 9600bps, 19200bps and 38400bps. For baud rate out of the above range, the default setting is 2400bps. Refer to the following table:

DIP Switch SW2-Baud Rate Settings				
Baud Rate	Positions1-3 Settings	1	2	3
2400		ON	OFF	OFF
4800		OFF	ON	OFF
9600		ON	ON	OFF
19200		OFF	OFF	ON
38400		ON	OFF	ON

1.4.5 Protocol Settings (High Speed Dome)

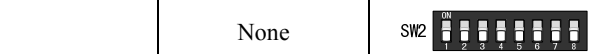
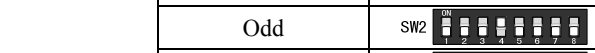
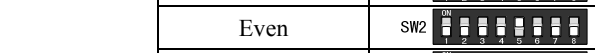
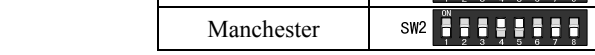
The positions 4-6 of DIP Switch SW2 are used for setting the communication protocols of dome. Refer to the following table (network speed dome model does not support Manchester code protocol):

DIP Switch SW2-Protocol Settings				
Protocol	Positions 4-6 Settings	4	5	6
Bosch Manchester		OFF	ON	ON
AD Manchester		ON	ON	ON
Self-adaptive	Others			

1.4.6 Parity and Manchester Code Settings (Medium Speed Dome & Network Speed Dome)

SW2 中的开关 4、5、6 用来选择智能球奇偶校验和曼码协议，以下是具体通讯协议对应的拨码方式（网络智能球不支持曼码协议）：

The positions 4-6 of DIP Switch SW2 are used for setting the parity and Manchester protocol of dome. Refer to the following table (network speed dome model does not support Manchester code protocol):

SW2-Parity and Manchester Code Settings				
Parity/Manchester	Positions 4-6 Settings	4	5	6
None		OFF	OFF	OFF
Odd		ON	OFF	OFF
Even		OFF	ON	OFF
Manchester		ON	ON	ON

1.4.7 Simplex/Half-duplex Settings

The position 7 of DIP Switch SW2 is used for setting the communication method of dome to simplex or half-duplex.

DIP Switch SW2-Simplex/Half-duplex Settings		
Description	Position 7 Setting	7

Simplex		OFF
Half-duplex		ON

1.4.8 Terminating Resistor Settings

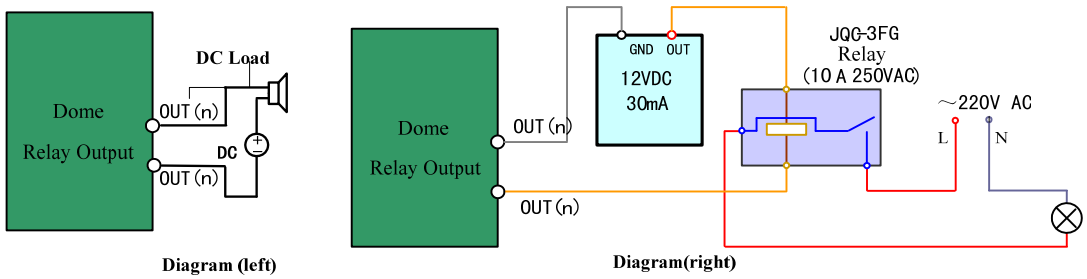
The position 8 of DIP Switch SW2 is used for setting the terminating resistor of dome.

DIP Switch SW2-Terminating Resistor Settings		
Description	Position 8 Setting	8
Not Terminated		OFF
Terminated		ON

1.5 Alarm In/Out Connections

Note: The Medium Speed Dome have no alarm inputs and alarm outputs.

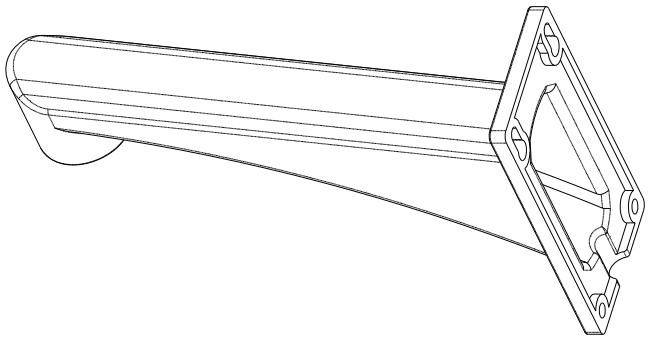
The high speed dome can be connected with 7 alarm inputs (0～12VDC) and 2 alarm outputs; and the network high speed dome is allowed to connect with 2 alarm inputs (0～12VDC) and 2 alarm outputs; and the network medium speed dome and the HD network speed dome is allowed to connect with 1 alarm inputs (0～12VDC) and 1 alarm outputs . Refer to the following diagram:

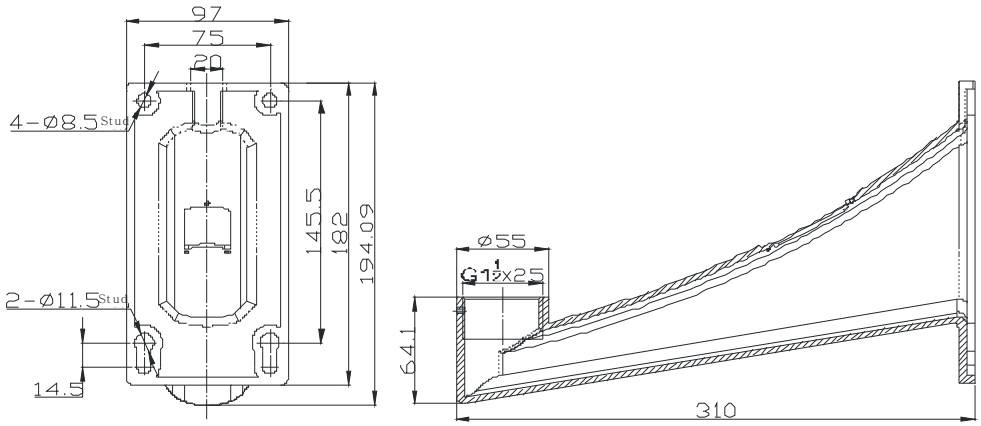


The alarm provides the relay output (no voltage), and the external power supply is required when it connects to the alarm device. For DC power supply (left diagram), the input voltage must be within the range of 12VDC, 30mA. For AC power supply, the external relay must be used (right diagram) so as to prevent damages to the unit and avoid risk of electric shock.

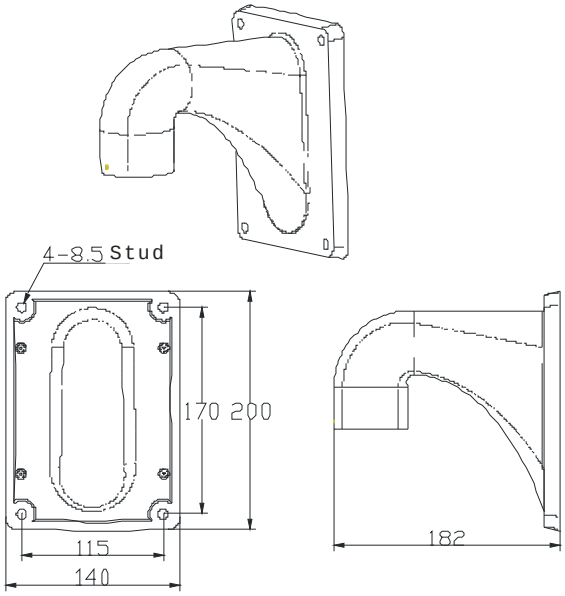
Chapter 2 Mounts Dimension

2.1 Long-arm Wall Mount

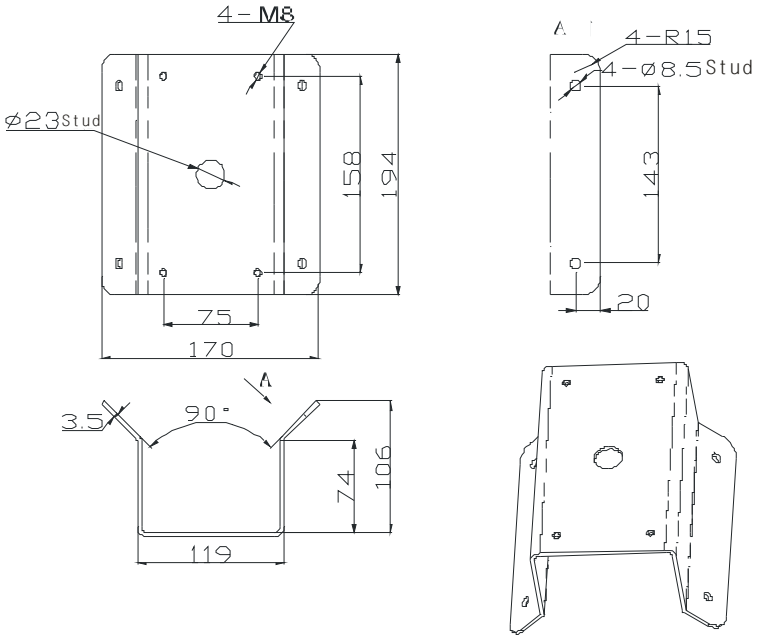




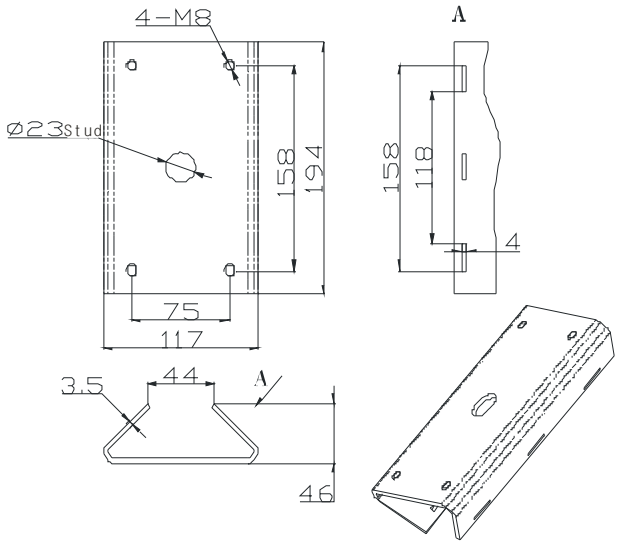
2.2 Short-arm Wall Mount



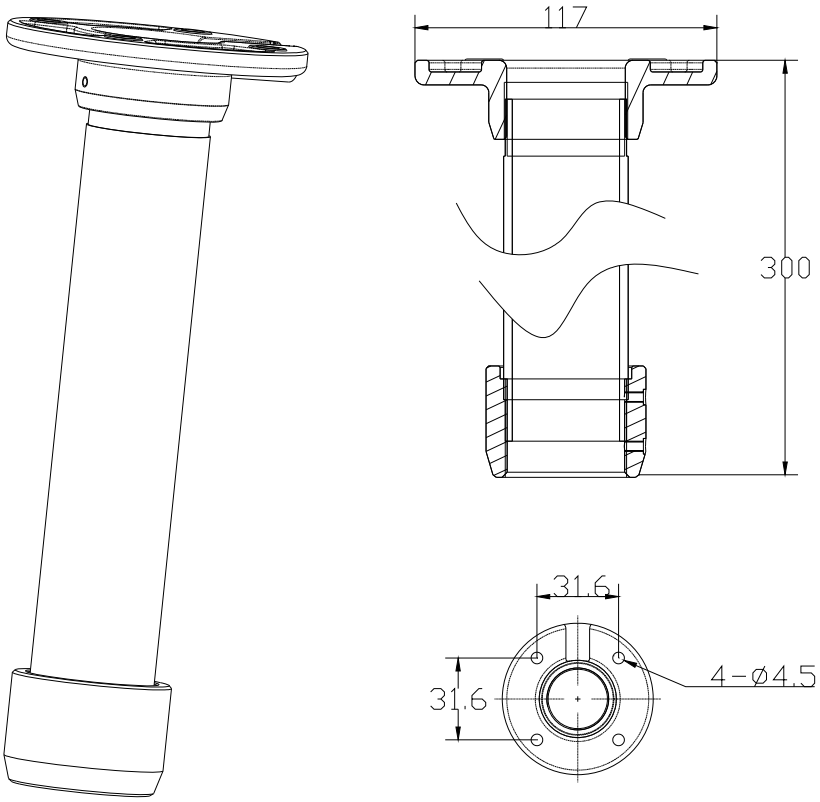
2.3 Corner Adapter



2.4 Pole Adapter



2.5 Pendant Adapter

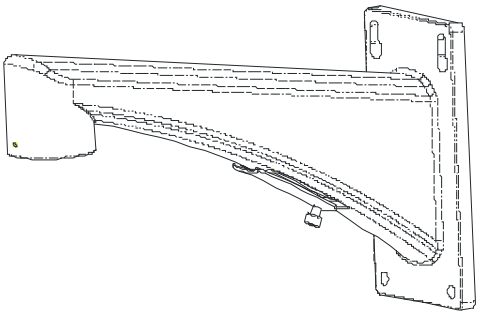


Chapter 3 Wall Mounting Applications

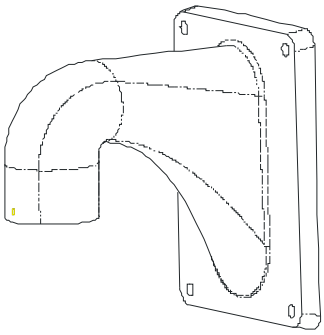
3.1 Mounting Components

- **Wall Mount**

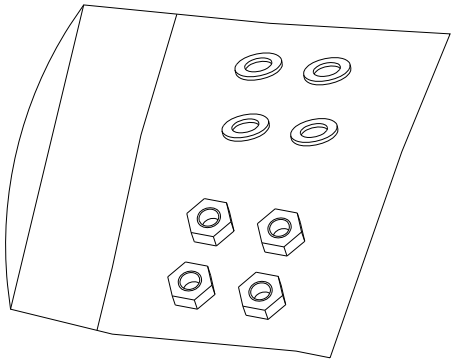
Applicable to indoor/outdoor pendant domes.



Or



- **Mounting Accessories**

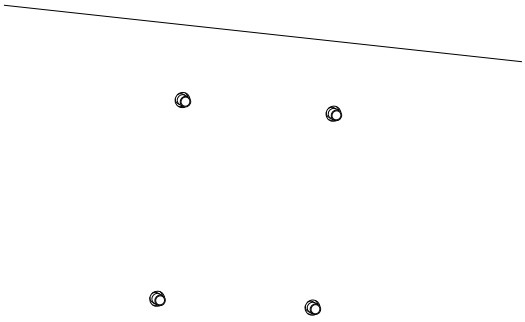


Nuts and Flat Washers

3.2 Wall Mounting Instructions

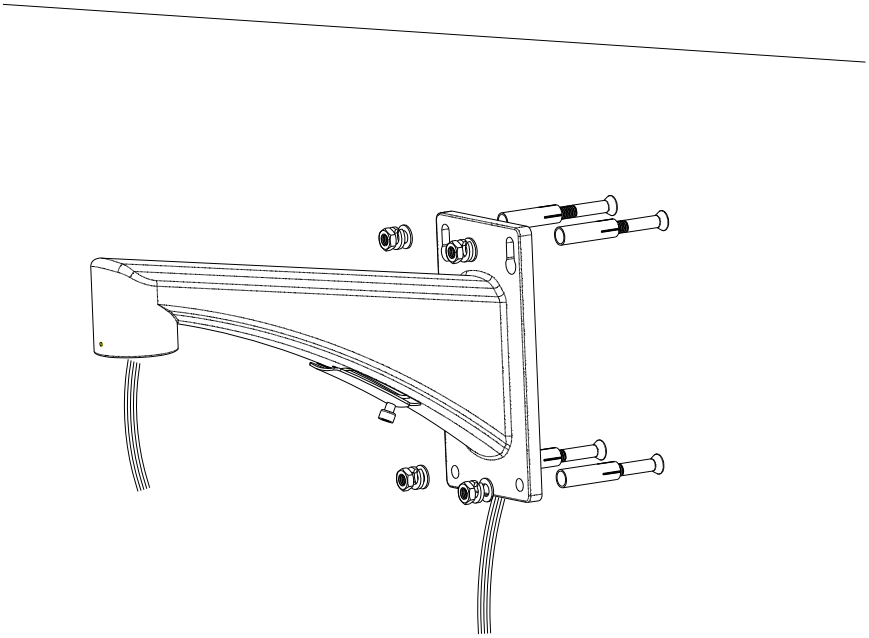
The wall mounting is applicable to the indoor/outdoor solid wall construction which should comply with the following mounting requirements:

- The wall must be thick enough to install the expansion screws.
- The wall must be capable of supporting up to 8 times the total load of the dome and its accessories.



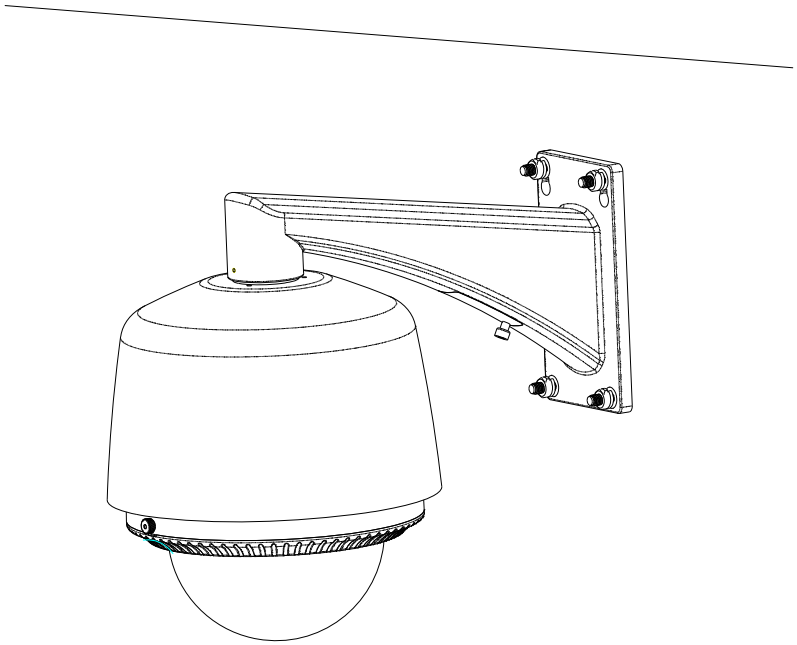
Step1: Drill mounting holes in the wall and install the expansion screws

Drill four holes in the wall according to the mounting locations, and then insert M6 expansion screws (not supplied) into the mounting holes.



Step2: Secure the wall mount to the wall

Fasten the expansion screws through the wall mount and gasket by using four hex nuts with flat washers to secure the wall mount to the wall.



Step3: Install dome to the mount

Feed cables through the opening on top of the back box, screw the back box into the threads in the mount, and then use M3 screws to secure the dome. Refer to *Section 1.2* for installation instructions.

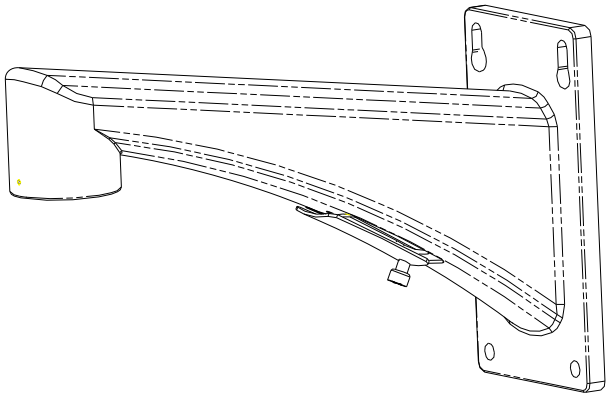
Note: Follow the same instructions described above for the Short-arm Wall Mount installation. For outdoor applications, please adopt the water-proof measures. The Short-arm Wall Mount is not recommended for outdoor applications.

Chapter 4 Corner Mounting Applications

4.1 Mounting Components

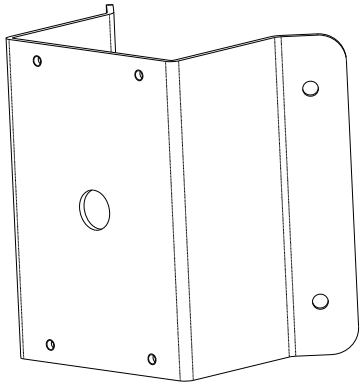
- **Wall Mount**

Applicable to the indoor/outdoor pendant domes with the use of corner adapter, wall adapter or pole adapter.

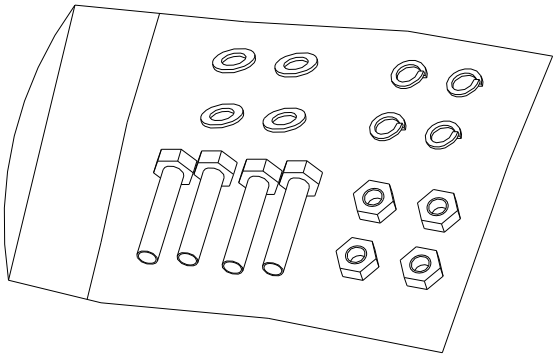


- **Corner Adapter**

For use with the wall mount in the corner mounting applications.



- **Mounting Accessories**

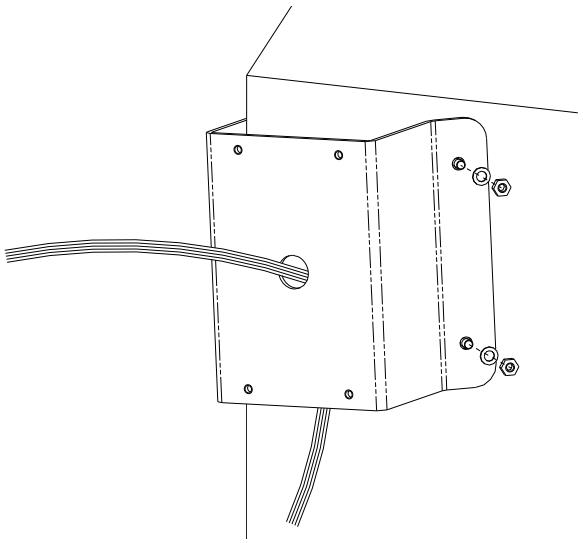


Hex Screws (M8×30), Nuts, Spring Washers and Flat Washers

4.2 Corner Mounting Instructions

The corner mounting is applicable to the indoor/outdoor 90° solid corner construction which should comply with the following mounting requirements:

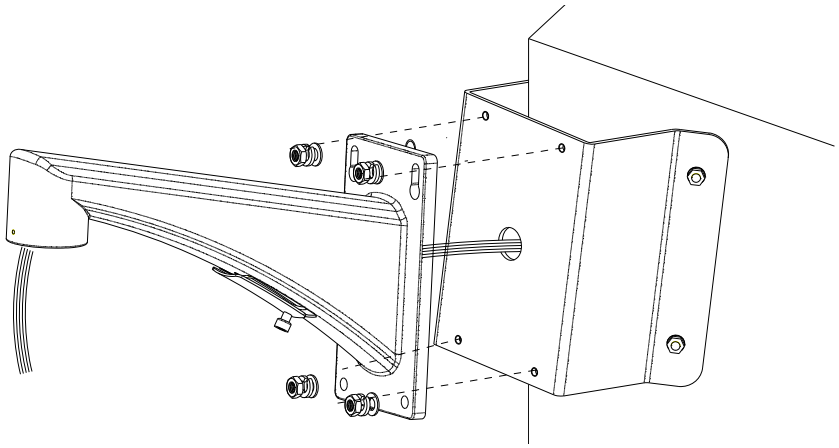
- The wall must be thick enough to install the expansion screws.
- The wall must be capable of supporting up to 8 times the total load of the dome and its accessories.



Step1: Install the corner adapter

Drill four holes in the corner according to the mounting locations, and then insert M6 expansion screws (not supplied) into the holes. Pull the power cord, video cable and control line through the opening of the corner adapter. Secure the corner adapter to the corner by using nuts and washers to tighten the four expansion screws.

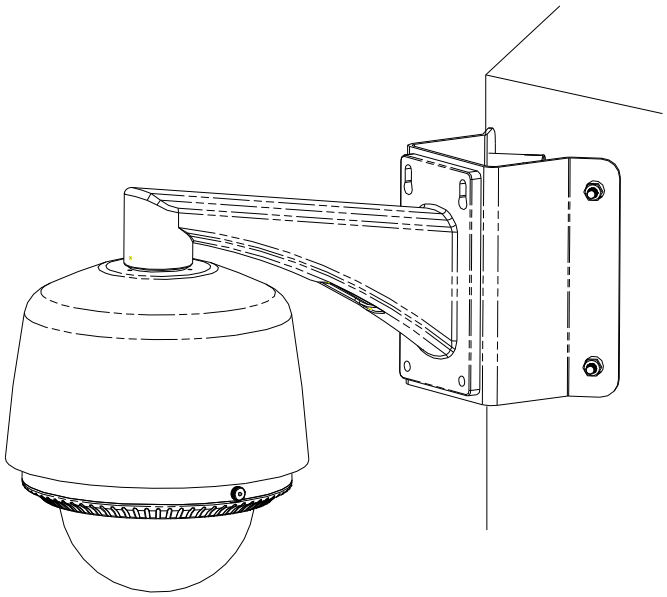
Note: Make sure the cables have enough length. For outdoor applications, please apply the sealant around the cable opening to prevent water.



Step2: **Secure the wall mount to the corner**

Apply four hex screws with the spring washers to the corner adapter through the wall mount and gasket.

Note: When tightening the screw, it is better to compress the spring washer firstly and then rotate half a round so as to maintain required waterproof effect without damaging the threads.



Step3: Install dome to the mount

Feed the cables through the opening on top of the back box, and attach the dome to the mount. Finally, use M3 screws to secure the two units. Refer to *Section 1.2* for installation instructions.

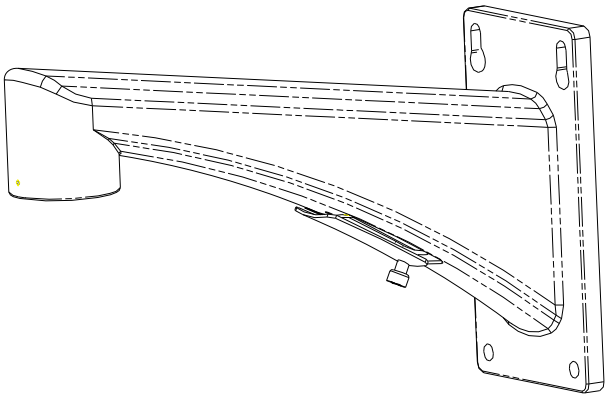
Note: Follow the same instructions described above for the Short-arm Corner Mount installation. For outdoor applications, please adopt the water-proof measures. The Short-arm Wall Mount is not recommended for outdoor applications.

Chapter 5 Pole Mounting Applications

5.1 Mounting Components

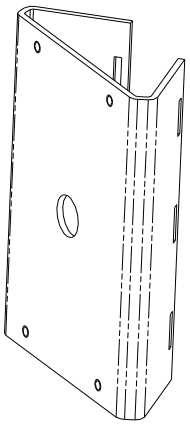
- **Wall Mount**

Applicable to indoor/outdoor pendant domes with the use of corner adapter, wall adapter or pole adapter.

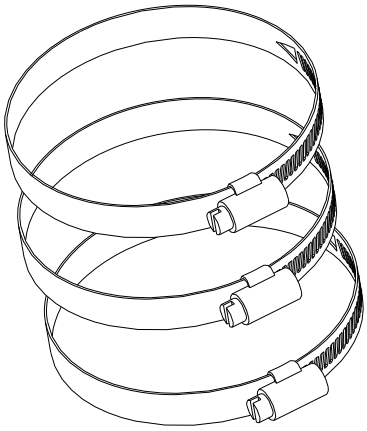


- **Pole Adapter**

For use with the wall mount in the pole mounting applications.

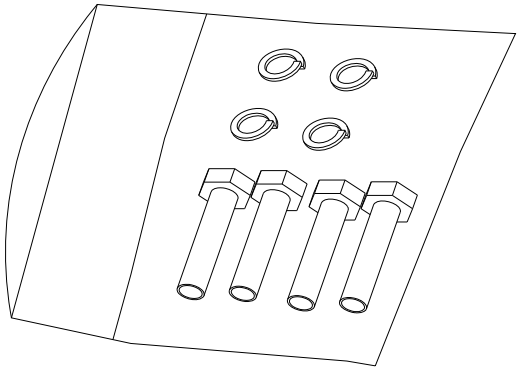


- **Stainless Steel Straps**



For use with the pole adapter, with the following dimensions selectable:
φ59-82mm, φ84-108mm, φ103-127mm, φ130-152mm, φ155-178mm, φ180-203mm, φ194-216mm;
Customized dimensions can also be provided according to user's demand.

- **Mounting Accessories**

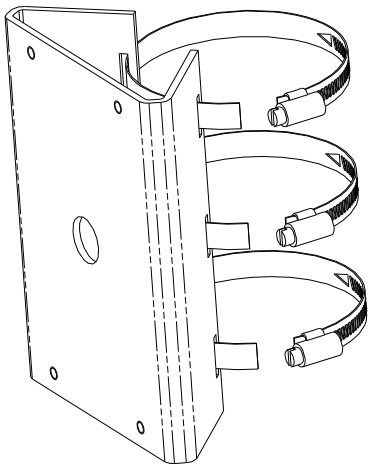


Hex Screws (M8×30) and Spring Washers

5.2 Pole Mounting Instructions

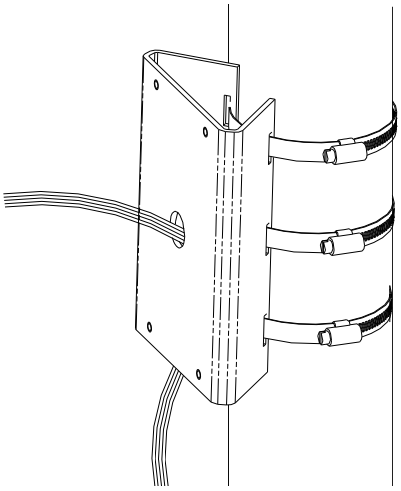
The pole mounting is applicable to the indoor/outdoor solid pole construction which should comply with the following mounting requirements:

- The diameter of pole must be constituent with the mounting dimensions of the stainless steel straps.
- The pole construction must be capable of supporting up to 8 times the total load of the dome and its accessories.



Step1: Assemble the pole mount adapter

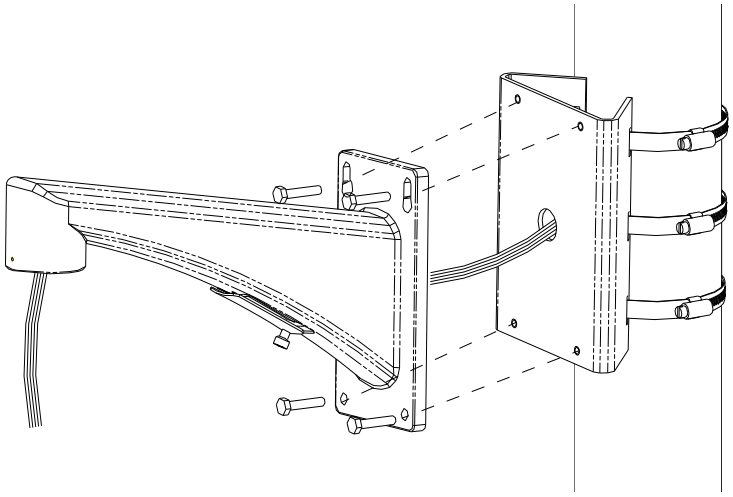
Use a screwdriver to loosen the three stainless steel straps and then insert them through the rectangle holes on the pole adapter.



Step2: Install pole adapter

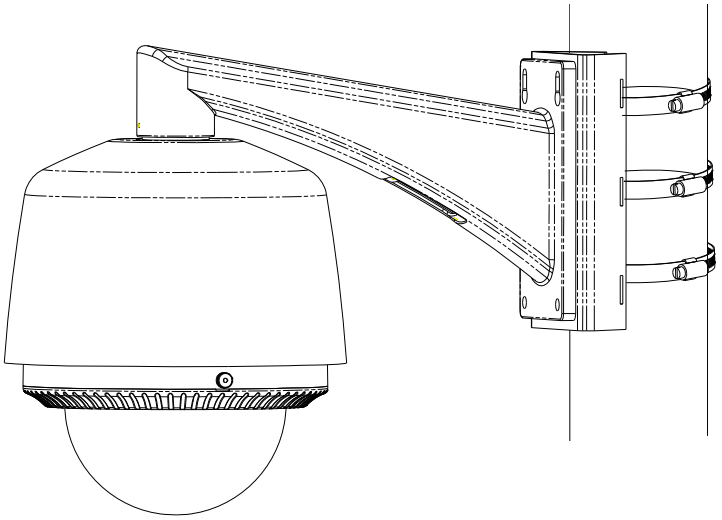
Feed the control line, video cable and power cable through the central opening and secure the three stainless steel straps to the pole, and finally use the screwdriver to fasten the screws at the steel straps.

Note: For outdoor applications, please adopt the water-proof measures.



Step3: Install wall mount assembly

Screw four hex screws with the spring washers to the pole adapter through the wall mount and gasket.



Step4: Install dome to the mount

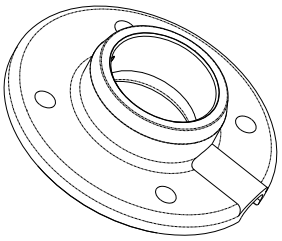
Feed the cables through the opening on top of the back box, and attach the dome to the mount, and finally use M3 screws to secure the dome. Refer to *Section 1.2* for installation instructions.

Note: Follow the same instructions described above for the Short-arm Corner Mount installation. For outdoor applications, please adopt the water-proof measures. The Short-arm Wall Mount is not recommended for outdoor applications.

Chapter 6 Pendant Mounting Applications

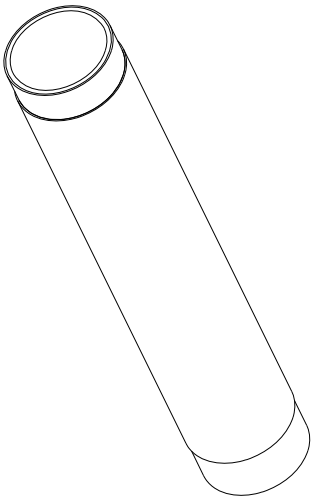
6.1 Mounting Components

- **Mounting Base**

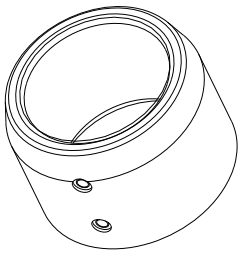


Applicable to pendant domes with the use of the pendant pole and pole adapter.

- **Pendant Pole**



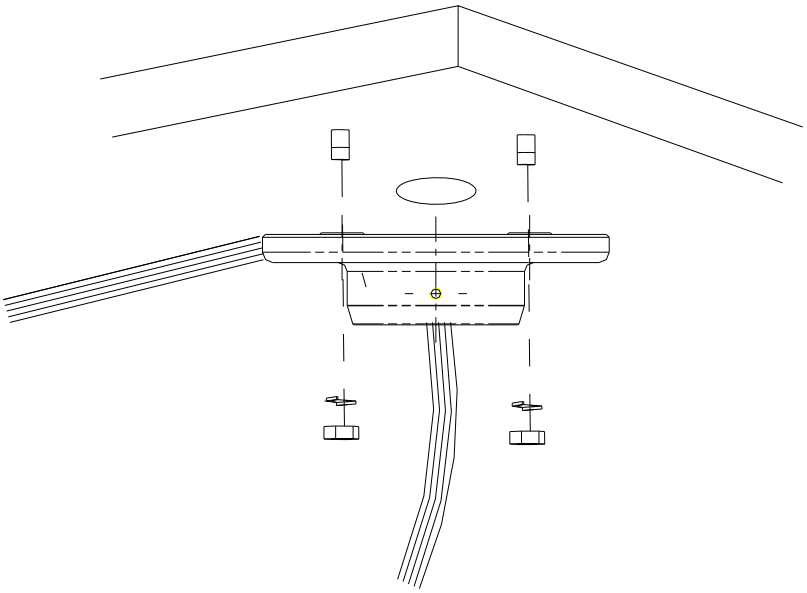
- **Pendant Adapter**



6.2 Pendant Mounting Instructions

The pendant mounting is applicable to the indoor/outdoor solid ceiling construction which should comply with the following mounting requirements:

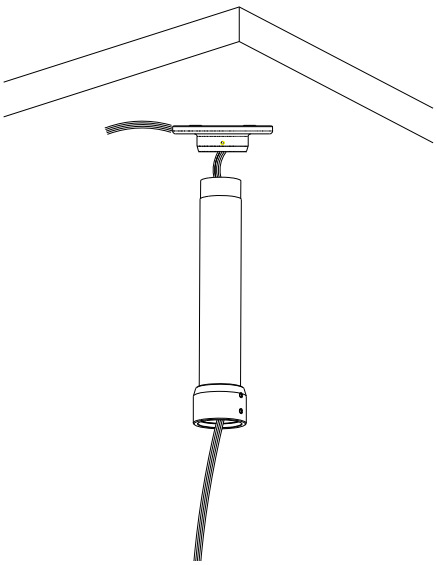
- The ceiling must be thick enough to mount the expansion screws.
- The ceiling must be capable of supporting up to 8 times the total load of the dome and its accessories.



Step1: Install the mounting base

Drill four φ6 holes in the ceiling according to the fastener holes locations of the mounting base, and then insert M6 expansion screws (not supplied) into the holes. Pull the power cord, video cable and control line through the opening at the mounting base. Secure the mounting base to the corner by using nuts and washers to tighten the four expansion screws.

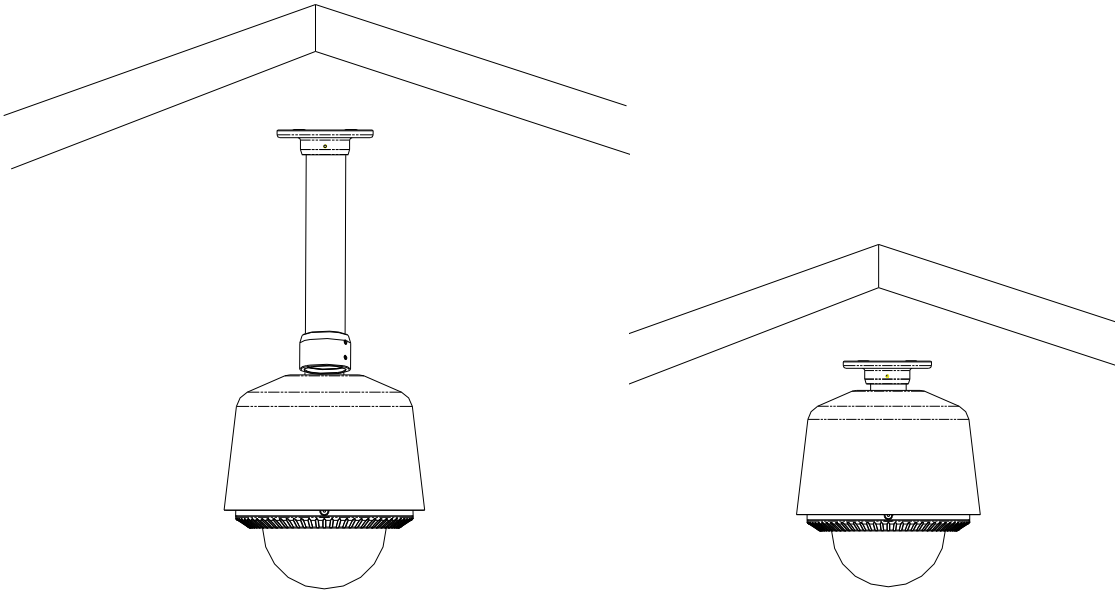
Note: Make sure the cables have enough length. For outdoor applications, please apply water-proof measures between the ceiling surface and mounting base and around the cables opening. The pendant mounting application is not recommended for outdoor environment where directly suffers rain.



Step2: Install the pendant pole

Swivel the pendant adapter into the matching pendant pole and then use the retainer screws to secure the two parts. Pull out the cables through the pendant pole and screw the pendant pole into the mounting base and use the set screws to secure the two parts as well.

Note: For outdoor applications, please apply the water-proof thread compound to the threads.



Step3: Install dome to the mount

Feed the cables through the opening on top of the back box, and attach the dome to the pendant pole, and finally use M3 screws to secure the dome. Refer to *Section 1.2* for installation instructions.

***Note*:** In case of insufficient ceiling height, directly attach the dome to the mounting base without use of pendant pole, as shown in the figure right above.

Chapter 7 In-ceiling Mounting Applications

7.1 Installation Conditions

The in-ceiling mounting is applicable to the indoor ceiling construction which should comply with the following mounting requirements:

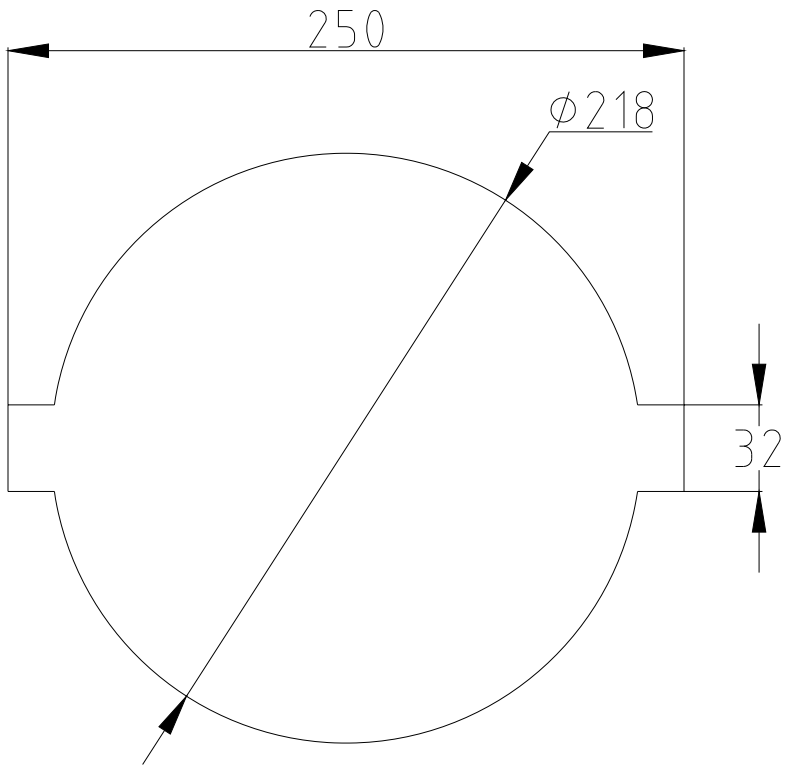
- The height above the ceiling must be more than 250mm.
- The ceiling must be with the thickness of 5～40mm.
- The ceiling must be capable of supporting up to 5 times the total load of the dome and its accessories.

7.2 In-ceiling Mounting Instructions

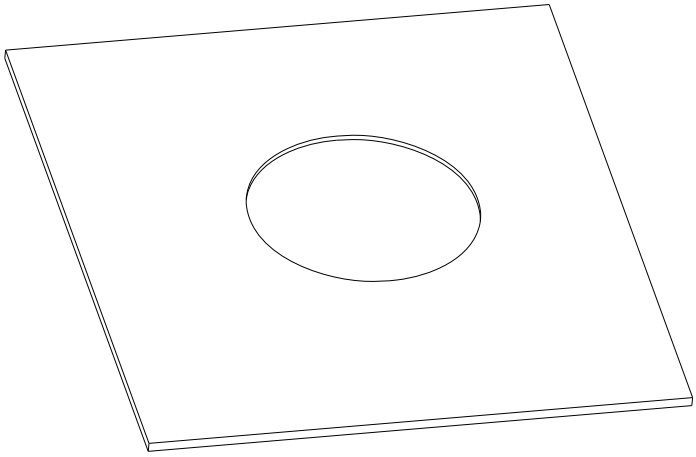
Step1: Drill holes in the ceiling

Take out the drill drawing from the package and use it as a template to draw a circle on the ceiling and then cut out the circle.

Note: The allowable tolerance of diameter is 2mm.



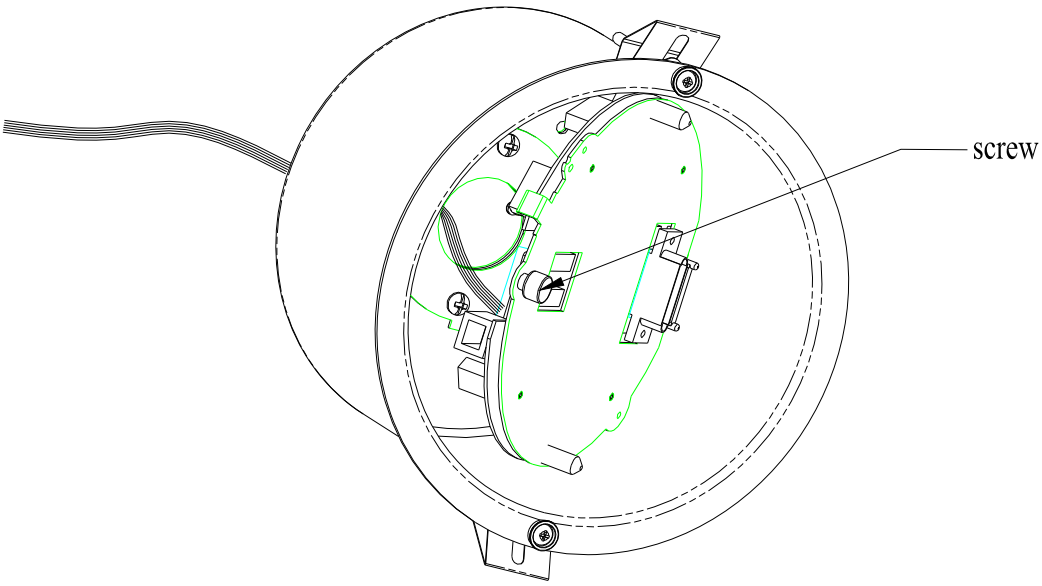
Drill Drawing



Step2: Connect cables

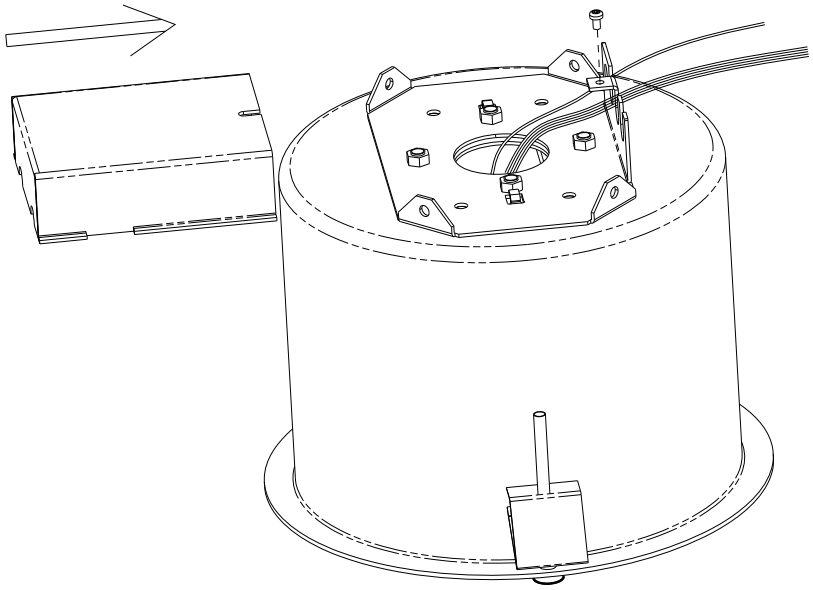
Open the hinged door and feed the power cord, video cable, control line and network cable through the opening of the back box, and then connect all wiring to corresponding sockets located on the circuit board. After connections, close the hinged door. The red LED indicator will light when the power is applied to the unit.

Note: Power off the unit after power-up check of the dome is finished.

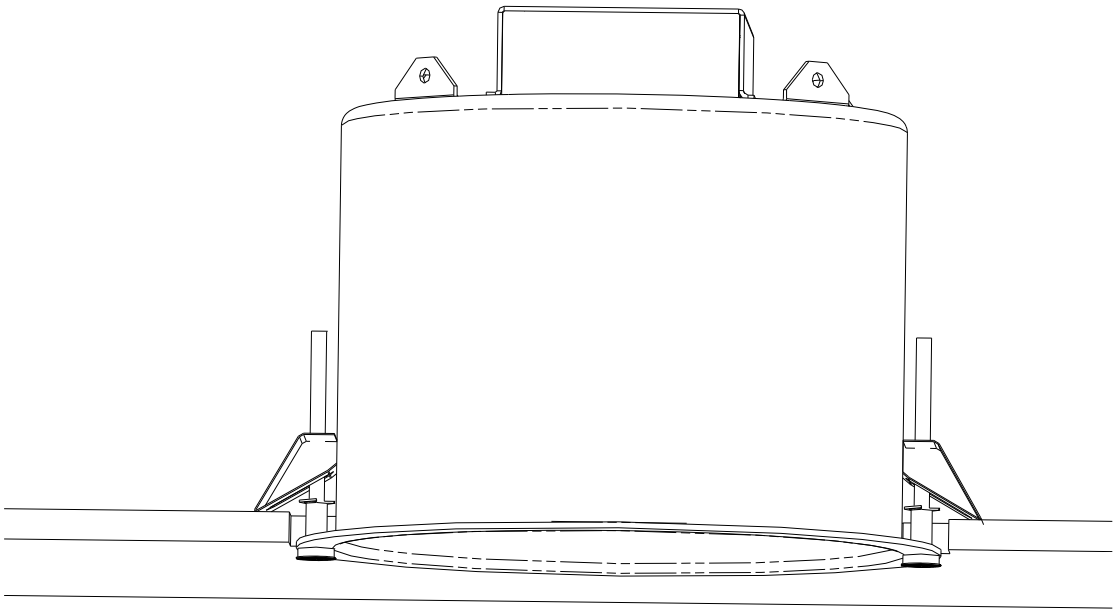


Step3: Install the back box

Firstly, loosen the two set screws on both sides of the back box to make them lie in the location as shown in the following figure:



Push the in-ceiling mounting base into the mounting hole in the ceiling, and use the screwdriver to tighten the set screws which will automatically compress the ceiling and secure the mounting base.

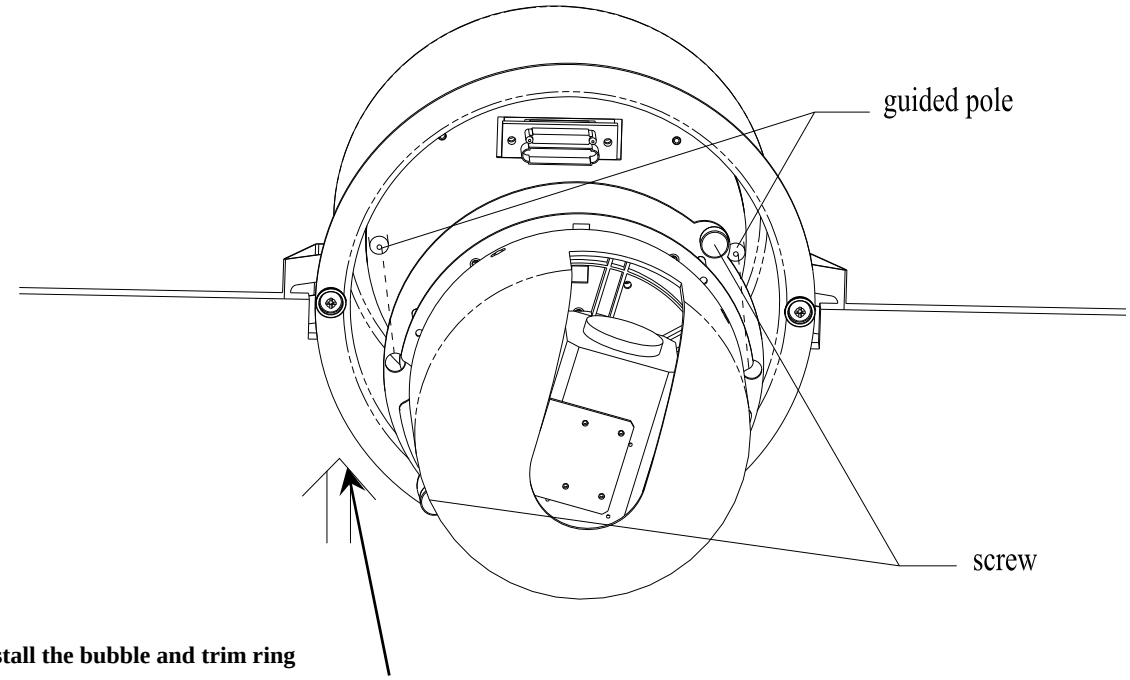


Step4: Install the dome drive

Take out the dome drive from the packing case, and check whether the drive has any damages or abnormal conditions. Set the baud rate, control protocol and address of the dome by referring to the *Operation Installation Manual of Speed Dome*. And push the dome drive to onto the mounting base and secure it in position.

***Note*：** If future packing and transportation is required, or the dome drive needs to be returned to the manufacturer for repair due to failure occurrence during the operation, please use the original packing materials to pack the dome drive.

When the dome drive has been properly installed, please apply power to the unit and check whether its power-up self-test action performs normally.

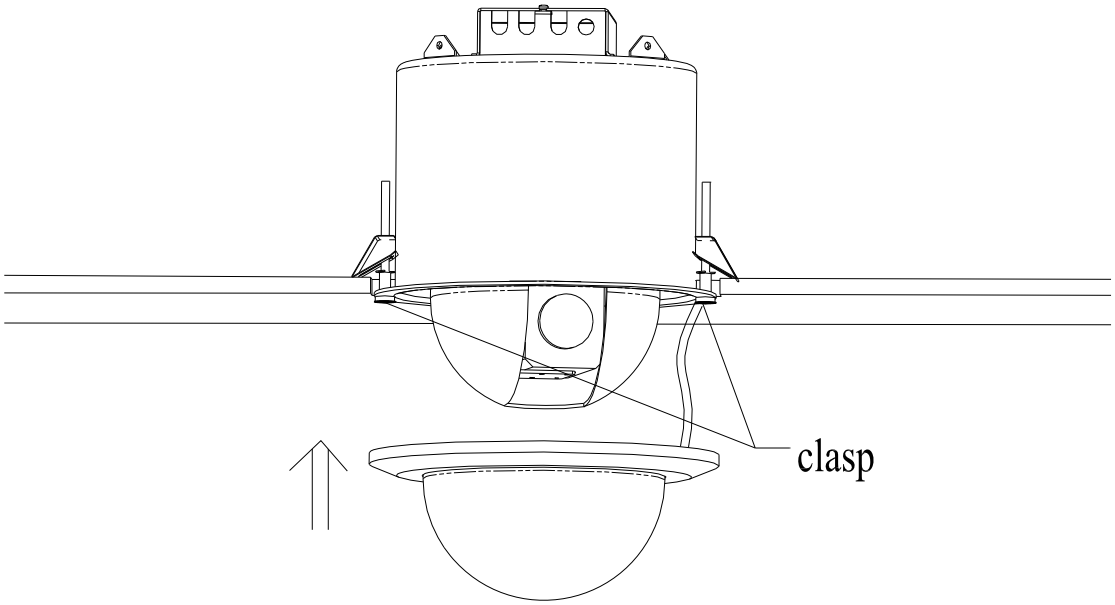


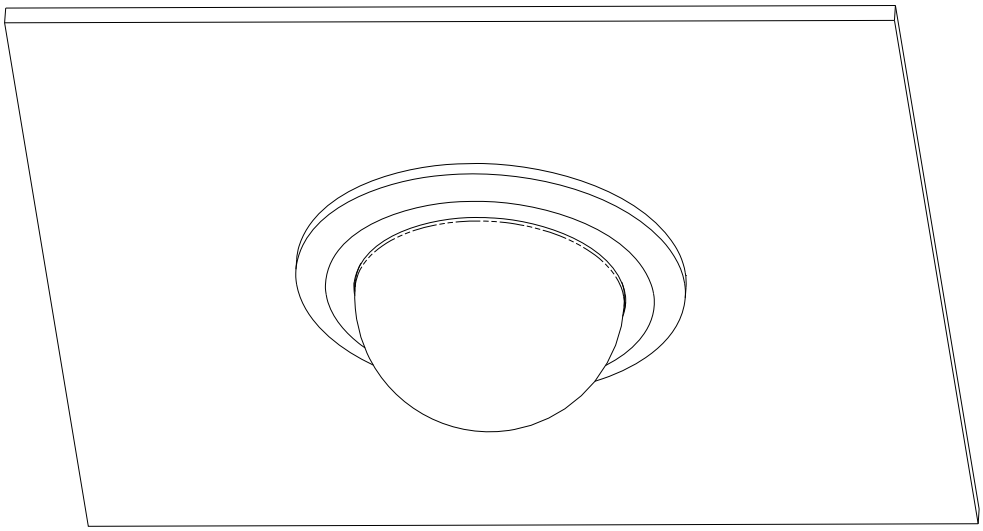
Step5: Install the bubble and trim ring

Attach the lower dome with the bubble to the dome drive, and swivel in clockwise direction to secure the bubble in place.

Place the trim ring into the bubble by alinging its fastening holes with the the ball stud on the mounting base, and finally tighten the two M3 screws to secure the lower dome.

Note: In order to maintain clear video images, do not touch the internal or outer part of the dome with your hands direcly or with other materials which will cause pollution to the dome.

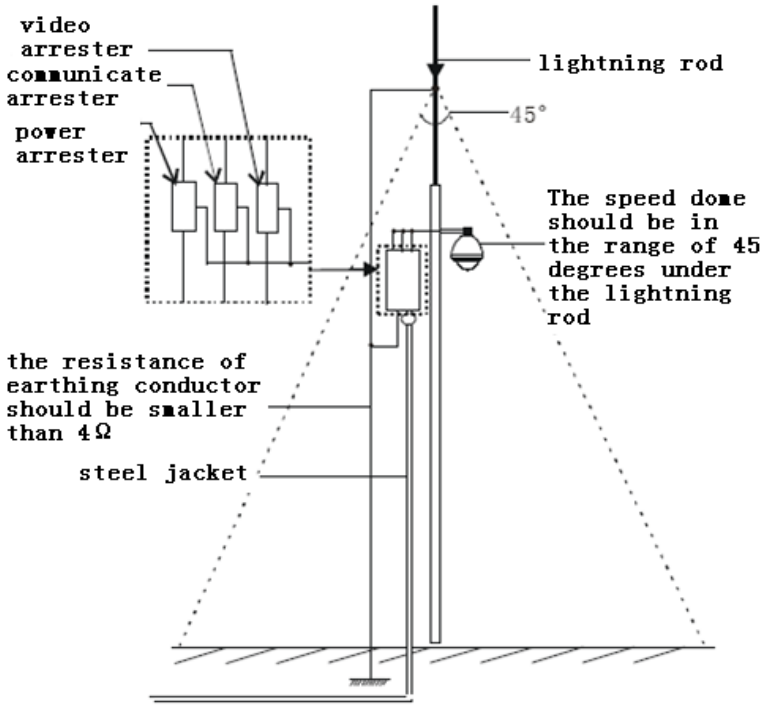




Appendix 1 Lightning & Surge Protection

This product adopts TVS plate lightning protection technology to avoid damage caused by pulse signal that is below 3000W, like instantaneous lighting, surging, etc. According to the actual situation outdoors, necessary protection measures must be taken to secure the electrical safety.

1. The distance between signal transmission line and High-voltage equipment or high-voltage cable is at least 50m.
2. Outdoor wiring should better be along the eaves as much as possible.
3. In the open field, wiring should be buried underground in sealed steel pipe, and the steel-pipe should be one-point grounding. Overhead routing method is forbidden.
4. In strong thunderstorm area or high induction voltage areas (such as high-voltage transformer substation), high power lightning protection apparatus and lightning conductor are necessary to be appended.
5. The design for installation and wiring with lightning protection and grounding in mind should be combined with the lightning protection consideration of the building, and conform to the related national standards and industry standards.
6. The system should be equipotentially grounded, and the grounding equipment must satisfy double-request of system anti-jamming and electric safety, and it must not appear short circuit and open circuit with the zero conductor of strong grid. When the system is grounding individual, the resistance should be no more than 4Ω, the section al area of the grounding cable should be no less than 25mm^2. For grounding instructions, please refer to the *Installation Manual of Speed Dome*.



Appendix 2 RS485 Bus Connection

1. General Property of RS485 Bus

According to RS485 industry bus standard, RS485 is a half-duplex communication bus which has 120Ω characteristic impendence, the maximum load ability is 32 payloads (including controller device and controlled device).

2. RS485 Bus Transmission Distance

When using 0.56mm (24AWG) twisted-pair line, according to different baud rate, the max transmission distance theory table is shown as below:

Baud Rate	Max Distance
2400BPS	1800m
4800BPS	1200m
9600BPS	800m

The transmission distance will be decreased if we use the thinner cable, or use this product under the strong electromagnetic interference situation, or there are lots of devices are added to the bus; on the contrary, the transmission distance will be increased.

3. Connection Method and Terminal Resistance

1) RS485 industry bus standard require daisy-chain connection method between any devices, both sides have to connect a 120Ω terminal resistance (show as Diagram 1), the simplified connection method is shown as diagram 2, but the distance of "D" should not be too long.

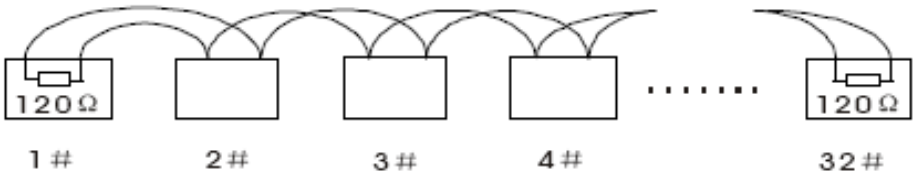


Diagram 1

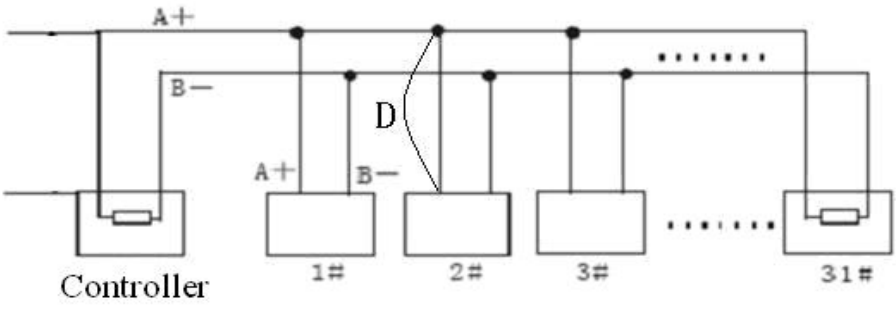


Diagram 2

2) Connection of 120Ω terminal resistor

The 120Ω terminal resistor can be connected through the DIP switch on the communications board, as high speed dome shown in Figure3. For a new dome, the 120Ω matching resistor is defaulted as unconnected, switch on the eighth bit of SW2, it will be connected. Conversely, switch off the eighth bit of SW2, it will be unconnected.

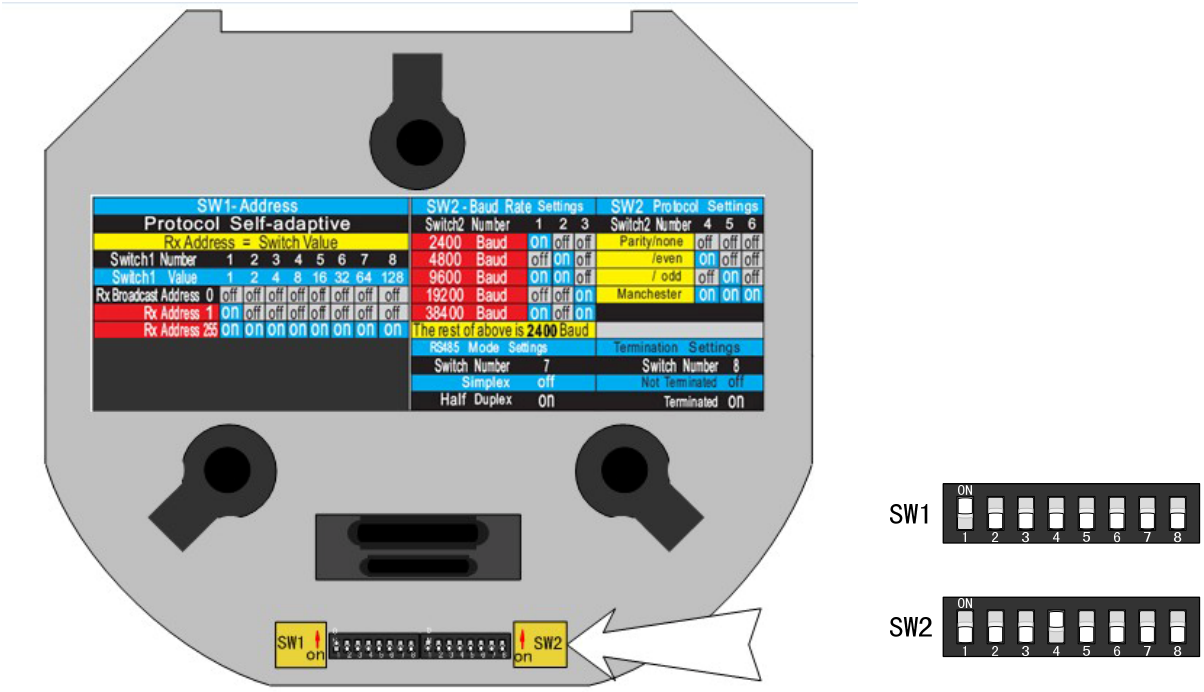

SW1-Address
Protocol Self-adaptive
Rx Address = Switch Value
Switch1 Number 1 2 3 4 5 6 7 8
Switch1 Value 1 2 4 8 16 32 64 128
Rx Broadcast Address 0 off off off off off off off off
Rx Address 1 on off off off off off off off
Rx Address 255 on on on on on on on on
SW2 - Baud Rate Settings
Switch2 Number 1 2 3
2400 Baud on off off
4800 Baud off on off
9600 Baud on on off
19200 Baud off off on
38400 Baud on off on
The rest of above is 2400 Baud
RS485 Mode Settings
Switch Number 7
Simplex off
Half Duplex on
SW2 Protocol Settings
Switch2 Number 4 5 6
Parity/none off off off
/even on off off
/ odd off on off
Manchester on on on
Termination Settings
Switch Number 8
Not Terminated off
Terminated on
SW1
on
SW2
on
SW1
ON
1 2 3 4 5 6 7 8
SW2
ON
1 2 3 4 5 6 7 8

Figure 3

4. Problems in the Practical Application

Normally, users adopt star-shape connection method in construction, under this situation, the terminal resistors must be connected between two farthest devices (as Figure 4, 1# and 15#), but this connection method is not satisfy the requirement of the RS485 industry standard so that it will lead to some problems such as signal reflection, anti-jamming ability decline when the devices are faraway. At this time, the dome will be uncontrollable, or self-running, etc.

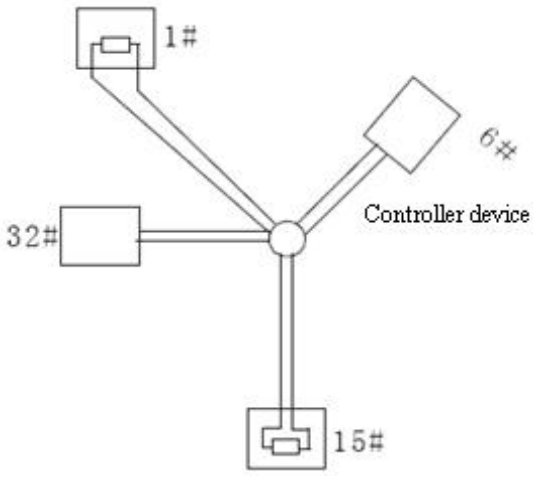


Figure 4

For such case, the best way is adding a RS485 distributor. This product can effectively change the star-shape connection to which satisfies the requirement of RS485 industry standard, in order to avoid those problems and improve the communication reliability. Show as figure 5.

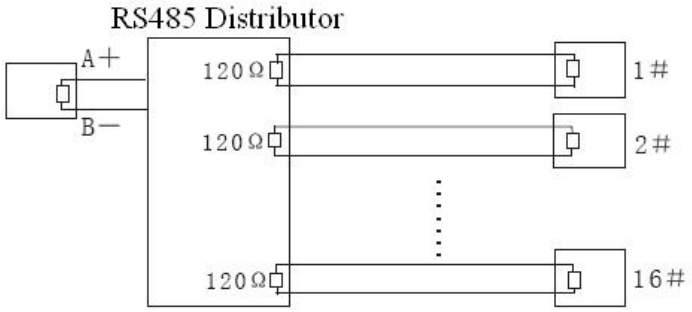


Figure 5

1. FAQ of RS485 Bus

Fault Phenomenon	Probable Cause	Solutions
The speed dome do the self-check but can not be controlled.	1. The address or Baud Rate is not matched between Host and the Speed Dome.	1. Adjust the address or Baud Rate of Host or Speed Dome to make a match.
	2. RS485+,- are connected incorrectly.	2.Change the RS485+ and RS485- wires.
	3. Wiring drops,	3.fastening the wire
	4. RS485 wire broke;	4. Change RS485 wire.
The speed dome can be controlled but not smoothly	1. loose contact of RS485	1. fastening RS485 wire;
	2. one RS485 wire broke;	2. Change RS485 wire.
	3. Host and speed dome are too far away	3. Add terminal matched resistance
	4. Too many speed domes are connected	4. Add RS485 distributor

Appendix 3 24VAC Wire Gauge & Transmission Distance

The following table has described the recommended max. distance adopted for the certain wire gauge when the 24VAC voltage loss rate is less than 10%. For the AC driven device, the maximum voltage loss rate allowable is 10%. For example, for a device with the rating power of 80VA which is installed at a distance of 35 feet (10m) away from the transformer, then the minimum wire gauge required is 0.8000mm.

Wire Gauge mm / Distance feet(m) / Power (va)	0.8000	1.000	1.250	2.000
10	283 (86)	451 (137)	716 (218)	1811 (551)
20	141 (42)	225 (68)	358 (109)	905 (275)
30	94 (28)	150 (45)	238 (72)	603 (183)
40	70 (21)	112 (34)	179 (54)	452 (137)
50	56 (17)	90 (27)	143 (43)	362 (110)
60	47 (14)	75 (22)	119 (36)	301 (91)
70	40 (12)	64 (19)	102 (31)	258 (78)
80	35 (10)	56 (17)	89 (27)	226 (68)
90	31 (9)	50 (15)	79 (24)	201 (61)
100	28 (8)	45 (13)	71 (21)	181 (55)
110	25 (7)	41 (12)	65 (19)	164 (49)
120	23 (7)	37 (11)	59 (17)	150 (45)
130	21 (6)	34 (10)	55 (16)	139 (42)
140	20 (6)	32 (9)	51 (15)	129 (39)
150	18 (5)	30 (9)	47 (14)	120 (36)
160	17 (5)	28 (8)	44 (13)	113 (34)
170	16 (4)	26 (7)	42 (12)	106 (32)
180	15 (4)	25 (7)	39 (11)	100 (30)
190	14 (4)	23 (7)	37 (11)	95 (28)
200	14 (4)	22 (6)	35 (10)	90 (27)

Appendix 4 Table of Wire Gauge Standards

Bare Wire Gauge (mm)	American Wire Gage AWG	(British)Standard Wire Gauge SWG	Cross-sectional Area ofBare Wire mm^2
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35		0.01539
0.160	34	37	0.02011
0.180	33		0.02545
0.200	32	35	0.03142
0.230	31		0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1257
0.450	25		0.1602
0.560	24	24	0.2463
0.600	23	23	0.2827
0.710	22	22	0.3958
0.750	21		0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15		1.7663
2.000	12	14	3.1420
2.500			4.9080.
3.00			7.0683